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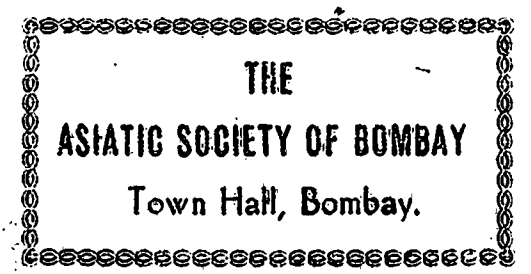

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THE HUMAN MIND:

A DISCOURSE ON

ITS ACQUIREMENTS AND HISTORY.

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By S. W. FULLOM,
AUTHOR OF "THE MARVELS OF SCIENCE," ETC. ETC.

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"The knowledge of man is as the waters—some descending from above, and some springing from beneath: the one informed by the light of nature, the other inspired by divine revelation."—BACON.

IN TWO VOLUMES.

VOL. I.

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PREFACE.

THE history of the human mind is the whole progress of man. It embraces every discovery of science, every achievement of art, every intellectual and mechanical invention. It comprehends, besides, all the errors and delusions, all the false theories, and all the superstitions, which have at any period beset the human race. Nor is even this the limit of the subject; for it claims some notice of the great leaders of the movement, as examples of the power, and instances of the versatility of the understanding; and,

finally, it treats of the various systems of mental philosophy, morals, and religion, which have from time to time prevailed among mankind.

A subject so vast, if viewed in its full extent, might defy the grasp of a single work; but I have thought it possible to catch up its salient points, and give, in a readable compass, an outline of a story so universally interesting. In carrying out this design, I have preserved a chronological sequence, except where it would involve repetition; and, as far as my space would permit, have endeavoured to present every incident that has signally influenced the progress of knowledge.

The state of my health obliges me to lay down the pen; and I shall feel the greater satisfaction if this work, as it is to be my

last, should prove useful. Nor can I conclude without expressing my acknowledgments to the public, and to my brethren of the press, for the favour with which they have received my productions, which makes me regret the more that my vocation is at an end.

S. W. F.

20, Chalcot Terrace, Primrose Hill,
December 2, 1857.

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THE HUMAN MIND.

BOOK THE FIRST.—ANTIQUITY.

I.

THE BEGINNING.

It is impossible to ascertain the state of the human mind in the first ages of the world. We learn, indeed, from the testimony both of Holy Writ and tradition, that the heart and affections of men had so deteriorated, that all flesh had become 'corrupt;' but this moral debasement was not incompatible with an advanced civilization. Reason would suggest that the length of man's life, embracing hundreds of years, must have tended to develop his faculties, to amplify his knowledge, and to enlarge his experience. Improvement could not but be rapid, when circumstances were so favourable to its extension. Who could fail to be wise when everyone kernelled in his mind

the observations and incidents of centuries, was a survivor of remote times, and, in fact, was History? The concentration of mankind, too, as is generally believed, in a limited portion of the world, would afford additional facilities of intercommunication, and so render the accumulated wisdom of ages a common inheritance. Hence the arts and sciences must have daily become more matured, more diffused, and more familiar.

If we admit such reasoning, it will account for the evidences of civilization and mental development which present themselves immediately after the Flood, as soon as society began once more to acquire body and form. What more natural than that Noah, who was six hundred years old on entering the Ark, and was doubtless master of all the learning of the time, should have preserved to the new human family every useful art and acquirement? The patriarch Job appears to intimate as much, when he refers to the knowledge received from his 'elders;' and it is universally believed that the twelve constellations, as now delineated, were first marked out on the heavens by antediluvian astronomers.

Whatever progress may have been made by man in the twenty centuries prior to the Flood

—which, it must be remembered, extend over a third of the whole period of his existence on the earth—the original condition of the human mind was undoubtedly very low. Though created in the image of God, after the likeness of the divine intelligence, its vast capacity was only to be developed by time. The ignorance of our first parents was such, that they were unable to distinguish good from evil; and when, after the Fall, they lost their innocence, they were so inexpert and unready, and so unequal to the simplest requirements of their situation, that God deigned to instruct them how to provide themselves clothes with the skins of beasts. We should now be perplexed to discover a condition of intellect sufficiently obtuse and contracted, as to occupy the same level; for among the most savage nations, time, adapting man to the circumstances and things around him, has everywhere introduced a power to supply the first wants of nature. This is indeed the result of a long course of ages, slowly worked out by many intellects, and not the effect of one unaided mind. It may, at first, be repugnant to our vanity, but there is ground for believing that the darkened understanding of the African bushman is the nearest existing type of the intelligence of

Adam. But this narrow capacity was susceptible of boundless enlargement; and we shall feel little degradation in deriving from such a beginning those mighty powers of thought and induction, by which, in a few thousand years, man has attained his present intellectual eminence, placing him in his natural position in the Creation, only a little lower than the angels.

The initial operations of the mind are obviously directed by our necessities. Man, in his lowest state, seeks only to provide against cold, hunger, and thirst. Thus husbandry became the first of the arts; and Cain, a murderer and fratricide, bequeathed to mankind the legacy of the plough. Clothes, food, and dwelling secured, the wants of the body supplied, man would next desire employment for his faculties, by conversation, by amusement, by contemplation. Each tended to enlarge his powers, to exercise his invention, and to enlighten his understanding. Conversation afforded an interchange of ideas, which always begets and stimulates others; the diversions of fishing and hunting called for observation and adroitness, suggesting some necessary contrivances to secure the spoil; and contemplation was naturally engaged by surrounding ob-

jects, first by the nearest, and then by the more distant. As Cain was the father of agriculture, Abel, watching his flock by night, a solitary observer of the starlit skies, may have been the founder of astronomy.

Mankind early became familiar with the use and manufacture of metals; and in the smithy of Tubal-Cain, the quick ear of Jubal, his brother, caught the clear ringing sounds which prompted the invention of music. The building of cities became a ruling passion with the heads of families; and, as each would try to excel, and the rage for great works continued to spread, considerable advances were made in architecture. This necessitated a knowledge of mensuration and geometry, and must at least have introduced some novelty of design. The very outlines of nature, the standing tree, with its outspread boughs, and the dome-circling sky, would suggest the arch and column; and it is remarkable that Layard has discovered both in the most ancient of the Nineveh remains.[1] Navigation was probably but little practised except on rivers or lakes, or along familiar coasts, as the population is generally believed to have been confined to Asia, and, conse-

[1] 'Researches at Nineveh.'

quently, had little inducement to venture on the ocean. Nor is it surprising that two thousand years should elapse without such an advance in navigation, when we reflect that, in our later world, it was not till three thousand five hundred years after the Flood that Columbus crossed the Atlantic. It is no objection to this fact, that the American continent was then inhabited; for, by our Arctic explorations, we now know that it may be approached by land, and the huts of the Esquimaux have actually been traced round the coast from Europe to America.[2] The Ark, being constructed according to divine command, and to meet a special visitation, can afford no idea of the progress made in ship-building; but, from the tenor of the directions, their brevity and simplicity, leaving so much to the judgment and cunning of the builder, we may conceive that Noah was skilled in mechanics and geometry, as well as conversant with the laws of floating bodies; and hence that mathematics and hydrostatics were among the acquirements of the time. He is simply enjoined to make 'an ark of gopher wood; rooms shalt thou make in the ark, and shalt

[2] Armstrong's 'Personal Narrative of the Discovery of the North-West Passage.'

pitch it within and without with pitch: And this is the fashion which thou shalt make it of: the length of the ark shall be three hundred cubits; the breadth of it fifty cubits; and the height of it thirty cubits: A window shalt thou make to the ark, and in a cubit shalt thou finish it above: and the door of the ark shalt thou set in the side thereof, with lower, second, and third stories shalt thou make it.'[3] The dimensions of the Ark, here precisely stated, have been thought to be scarcely adequate to the living freight it was to accommodate; but, according to the calculations of Smellius and Arbuthnot, there was room and verge enough. Taking the cubit at the Jewish standard of eighteen inches, the whole area was half an acre. Arbuthnot computes the tonnage at 81,062 tons, but this must be in excess, as the *Leviathan*, which is 11 feet higher, is stated to be only 22,500 tons. In the directions to Noah, no reference is made to arrangements in the Ark for ventilation or draught, so indispensable to its promiscuous company; and unless it be supposed that these were secured by some miraculous provision, we must conclude that full reliance was placed on the power of Noah, by his scientific attain-

[3] Gen. vi. 14, 16.

ments and skill, to meet such necessary requirements.

But it is useless to speculate on the intelligence of an era which is for ever hidden from view. That remote period, with all its characters and incidents, is a closed page in the records of eternity; and the little facts that loom up from its grave, are, like the fossils that we dig from the earth, shadowy and confusing. It is a sure clue to the date of the Deluge, that while all is darkness before, from the time of its alleged occurrence the events of human history take a tangible shape. In the writings of Moses, the great leading incidents are faithfully chronicled; and the sacred narrative is borne out by various corroborative testimonies, by tradition, by geographical research, and by the remains of monuments reaching to the dispersion of man. The oldest book in the world, it is still, after an interval of four thousand years, widely accepted as the inspired word of our Creator, while it furnishes the only information we possess concerning the moral condition and progress of the early nations. Modern travel and research is continually confirming its statements, in a manner truly marvellous; and it is remarkable that the further we advance from that obscure antiquity, the

more we seem destined to learn of its history and usages.

The oldest written records of events—what may be called the foundations of the venerable fabric of history—are of a date long posterior to the early portions of the Scriptures. A wide gap of four hundred and fifty years divides them from Orpheus, who, if he ever existed, lived in the time of David, about B.C. 1040. The Hindoo Veda may probably claim the same date. Homer, the next in succession, was born about a century later; and Herodotus, the father of history, lived three centuries after the captivity of Judah, or about B.C. 445. Hence our only guide to that lost past is the Pentateuch, which indeed goes before us, like a pillar of fire, in the wilderness of the dead world.

The erection of the Tower of Babel, on the plains of Shinar, B.C. 2245, shows that the new generation of men shared the taste of their first progenitors, in respect to building; and, by this time, they must also have been skilled in various fundamental arts, and have had some knowledge of geometry, of the principles of architecture, and of the outlines of astronomy. The avowed object of the tower was, first, to 'reach unto the heavens,' mean-

ing, perhaps, to obtain an altitude sufficient for the accurate observation of the heavenly bodies, and, secondly, to form a rallying-point, which should keep the whole population of the earth in one region. This was in direct contravention of the divine commandment, and led to an incident memorable in the history of mankind, the precise effect of which cannot even yet be estimated. The builders, while pursuing their impious work, were struck with a confusion of languages, so that they could 'not understand one another's speech,' and thus this prodigious undertaking was brought to an abrupt conclusion.

Up to a recent period the only known record of this great incident was in *Genesis*, and its probability has often been disputed; but, in a joint exploration at Babylon, M. Oppurt and Sir Henry Rawlinson have disinterred a cylinder, which they found with two others under the identical tower of Babel; and it bears an inscription by Nebuchadnezzar, referring to the original construction of the tower, when the work, it is said, was interrupted by a general confusion of tongues, accompanied by thunders, lightnings, and earthquake. The inscription fixes the date of the event at a period of forty human lives anterior

to the restoration of the tower by Nebuchadnezzar, B.C. 570. If these lives are taken at the common average of thirty-five years, the date would just correspond with the Mosaic chronology.

It is not to be imagined that the diversity of tongues arose simply from accents and inflections, obscuring, without wholly abandoning, the original roots, but we are to consider that there was an actual multiplication of languages, each distinct from the other. Modern philologists have endeavoured to bring order out of chaos, by ranging languages in classes, according to alleged similarities of derivation, marking out, by certain affinities, three great stems, respectively named from the sons of Noah. Could the system be established, it would define the nature of the confusion of Babel, which might then be supposed to give to each of the three families of men a parent tongue, gradually diversified by the variations of locality. But some even of the oldest languages, such as the Chinese, defy analysis, or present roots altogether new, which bear no analogy to any other language. Thus the theory falls to the ground; and we are brought back to the obvious meaning of the

sacred historian, that there was a real diversity and confusion of speech.

Such an event would necessarily exercise considerable influence on the progress of the human mind; but not to the extent that, at first sight, might be supposed. Intercourse being rendered difficult, the immediate effect would be adverse to the diffusion of knowledge; but this would soon be obviated, while, on the other hand, we know that civilization was not advanced by the prevalence of a common tongue under the Roman empire. On the contrary, from the time when the Roman language was most widely known, learning, science, and the arts began to decline; and so destitute was the world of original genius, that Constantine was reduced to pilfer the statues of Greece and Italy, to decorate his Byzantine capital.

The end immediately contemplated by the confusion of tongues was the dispersion of mankind over the world; but as, in the economy of nature, we trace many phenomena to one cause, so, in this case, the same incident operated in manifold ways. We cannot but marvel that one of its ultimate tendencies was the very result which we might consider

it calculated to frustrate. It is truly said that necessity is the mother of invention; and the most pressing of our necessities is international intercourse. By this man was driven, in his isolation from his fellows, to draw on the latent resources of his mind. Hence arose the classification of sounds, their reduction into syllables, and, finally, their perpetuation, through the medium of an alphabet, in certain fixed and distinctive characters.

The formation of an alphabet indicates such originality of conception, and must have demanded such a concentration of thought and genius, that it has been very widely attributed to a direct revelation from heaven; and were we to calculate the effect it has exercised on human intelligence and the destinies of our species, it might assuredly be pronounced a divine invention. The adherents of this conclusion even state the precise time at which the gift was bestowed on man, announcing it as contemporaneous with the promulgation of the law from Mount Sinai, B.C. 1480. Certain it is, that the Hebrew alphabet is the oldest in existence, and to it we owe the precious bequest of the Pentateuch, which, as before remarked, exceeds in antiquity, by many ages, the oldest book of early times. It is here we

are directed to look for the alleged Scriptural authority for a divine origin of letters. 'And the Lord said unto Moses, Come up to me into the mount, and be there; and I will give thee tables of stone, and a law, and commandments which I have WRITTEN; that thou mayest teach them!'[4] And again, 'And Moses turned, and went down from the mount, and the two tables of the testimony were in his hand; the tables were WRITTEN on both their sides; on the one side and on the other were they written. And the tables were the work of God, and the WRITING WAS THE WRITING OF GOD, and drawn upon the tables.'[5] But in reference to these passages, it may be observed that writing is mentioned by Moses, in a manner that would show it was generally practised, prior to the delivery of the law from the holy mount. Five years before, B.C. 1485, the Hebrew leader is directly commanded to write an account of the war which had been waged with the Amalekites;[6] and, almost as the Sinai code was promulgated, the Israelites were enjoined to WRITE its enactments on their door-posts, leading us to conclude that the beautiful art was even familiar

[4] Exod. xxiv. 12. [5] Exod. xxxii. 15, 16.
[6] Exod. xvii. 14.

to the mass of the people. At all events, it was very early in use, and if specially communicated by the Deity, we are unable to fix either the date or the occasion of the revelation. Nor would such an interposition be consistent with the ordinary operations of Providence, which have rather left man, as an intellectual being, to develop his faculties by self-culture, and so work out his own elevation. At the same time, we can scarcely conceive that Moses, who mentions the invention of music, and the discovery of the properties of metals, would have passed over the introduction of letters, had it originated with God; and incompatible as such an invention may seem with mortal powers, we shall hereafter see that discoveries quite as marvellous have resulted from the unaided studies of the human mind. Hence we may draw the inference that this, not the statutes of Sinai, was the real adamantine tablet on which God traced the characters of the first alphabet.

There is certain evidence that letters were known to the early Egyptians; and as Moses was initiated in all the acquirements of that famous people, he probably learnt the art of writing in the colleges of Thebes. Though the honour of the invention is claimed by various

nations, and especially by the Phœnicians and the Hindoos, and has been awarded by Pliny[7] to Memnon, it is more justly attributed to Thoth, a priest of Egypt, described by Sanchoniathon, the Phœnician historian, as having lived in the twelfth or thirteenth generation from the Creation. If, for the Creation, we substitute the Deluge, this will be found to correspond with the era of the Taaut mentioned by Diodorus, who calls him the inventor, not only of letters, but also of grammar and music. Jackson[8] speaks of him by the same designation, as the son of Misraim, and fixes his epoch at 500 years after the Flood, B.C. 1849. But, as the son of Misraim, he is more likely to have lived 150 years earlier, or about B.C. 2000; since he must have been anterior to Abraham. However this may be, it is certain that he was held in great veneration by the Egyptians from time immemorial; and, under the names of Hermes and Mercury, was by the Greeks and Romans elevated into a god.

Thoth, then, is, after Noah, the first great character that history throws on the canvas. But what it presents is not a distinct figure, a portrait, nor even an outline. It is simply

[7] Plin. vii. 56.

[8] 'Chronological Antiquities.'

a dim, half-effaced blotch, like the effigy on an antique coin, blurred and shapeless. We seem to behold an Egyptian hieroglyph, to which we have no key, and which may stand for Sesostris, for Chæops, or half-a-dozen other primeval men, as correctly as for Thoth; and, in fact, this first benefactor of mankind has been confounded with kings and conquerors, who wallowed in human blood. His very name is so variously spelt by different authors, that often it can with difficulty be identified. Yet it still survives, and is still honoured. Renowned before the foundation of the pyramids, it will live when they have crumbled into dust.

As we recall his gifts to man, the hieroglyph casts its shroud, and Thoth appears in characters of light. Of his life, his appearance, his personal habits, all that gives presence and vitality, we know nothing; but for us and for latest generations he is not the less a real incarnate being. We know that, in his day, multitudes, the human race, hung on his lips. Before Moses, before the Pharaohs, he was a teacher, an oracle, a lawgiver, and a prophet. Even admitting that the letters he invented were merely an adaptation to the language of Egypt—that alphabetical writing had been

known in the old world, and had been communicated by Noah to the new; and supposing that the useful arts he introduced were derived from the same source, it is still to him we owe these precious heirlooms of our species. How ardently we desire some little glimpse of his career, to render him, as it were, visible to the eye, that we may know him as we know Kepler or Newton; but we probe myths and ransack chronicles in vain. Everywhere we hear of his labours, but of himself there is not a word. Perhaps there was nothing to record —only that his days were spent in labour, in counsel, or in study—framing equitable laws, devising some extension of mechanics or the arts, tracing the first rude lines of architecture and sculpture on the virgin rock. Night, with its clear cloudless sky, found him on the summit of the mountain, watching the courses of the stars, and carefully recording his observations for the instruction of future ages. Of this man of mind and grasp, we must be content to know that he lived, and that it was not for himself alone, nor only for his own era and people, but for all generations and all time.

Whether alphabetical characters were invented or only restored by Thoth, we may

trace their rudiment to picture-writing, which nature suggests as a ready mode of representing ideas. The Egyptians, according to Florus Apollo, indicated a fuller of cloths by painting a man's two feet in water, and a siege was denoted by a scaling ladder. But though things and objects might be delineated, it was not so easy, in this infancy of the art, to depict the faculties of the mind, and communicate the invisible operations of thought, passion, and feeling. Intellectual images could only be expressed figuratively; and hence arose the use of symbols, by which ideas, themselves purely spiritual, were denoted by sensible objects. Two feet standing upon water signified an impossibility, and the Deity was typified by the sun. This mode of writing obtained the name of Hieroglyphia, or sacred sculpture, and was early practised by the Egyptians, though of too occult a character to be familiarly used. Necessity, indeed, would soon dictate abbreviations, which, by degrees, lost their original form, and became mere arbitrary marks. The idea of an alphabet now presented itself, and would naturally be based on a theory of sounds.

Phonetic writing, as the foundation of the art, demanded a profound analysis of

the various organs of utterance, with a view to the reduction of sounds into elements, by which alone modes of expression could be indicated. Syllabic characters were the first result of this sublime speculation, and they have left a memorial of their epoch on the imperishable stones of Nineveh. Their rudiments would necessarily be vowels, which, indeed, are syllabic sounds of the simplest kind—consonants, with which they blend or combine, being merely elements, or, at least, such sounds as cannot possibly be articulated without the aid of a vowel. But, as syllabic writing became generally known, further efforts would be made to simplify and abridge, leading, at length, to the introduction of a series of letters, as a concise and definite alphabet.

The most ancient existing alphabet, if not the original source of all, is the old Hebrew, or Samaritan, which, though it has undergone several changes of form, is scarcely more perfect now than it was in the time of Moses. It is no longer used by the Jews, who, about the Babylonish captivity, adopted the square Hebrew, or Chaldaic; but the primeval characters are still perpetuated by the Samaritans, and preserve to us, in the writ-

ings of Moses, all that we know of the world's infancy.

There is great diversity in alphabets, which are sometimes defective, and sometimes redundant, while others, such as the English, are both the one and the other. The deficiency of the English alphabet in vowels is very striking, each of the vowels, undistinguished by any inflection, being successively made to denote a multiplicity of sounds, while several of the consonants are absolutely little more than repetitions, and the *x* is altogether superfluous. The number of letters is 26, while that of the Hebrew is only 22, and the compass of the Latin alphabet is the same. The Egyptian or Coptic contains 32 letters; the modern Russian 41; and the Chinese, who still practise the syllabic mode of writing, include in their alphabet no less than 80,000 characters.

The modern nations of Europe all derive their alphabets from the Roman: the Roman was drawn from the Greek: the Greek, said to have been introduced by Cadmus, was borrowed from the Phœnician: and it may safely be concluded that this was founded on the Hebrew, which, as before remarked, has handed down to posterity the most ancient specimens of alphabetical composition.

Writing was originally inscribed only on hard substances, metal, wood, or rock; and, accordingly, we find that the Decalogue was written on tables of stone. The instrument used by the scribe was made of iron, pointed at the end, and was called a style. Pliny affirms that, prior to the time of Homer, books were made of wood; and the volumes mentioned by Job were probably of this material. That ancient patriarch exclaims, 'Oh, that my words were now written! that they were printed in a book! That they were graven with an iron pen and lead in the rock for ever!'[9] The writers of that early day, if we may judge from this passage, indeed designed their works to endure: their pen was iron; molten lead was their ink; and their page the eternal rock. Lead was used by the Romans as a material for writing: and we learn from Pliny[10] that all public documents were composed of leaden plates or sheets. The practice of writing on a tablet is referred to in Isaiah,[11] 'Now go, write it before them in a table, and note it in a book.' Jeremiah[12] mentions both the instrument and the materials for writing. 'The sin of Judah is written

[9] Job xix. 23, 24.
[10] Lib. xiii. c. 11.
[11] Isaiah xxx. 8.
[12] Jer. xvii. 1.

with a pen of iron, and with the point of a diamond: it is graven upon the *table* of their hearts.' At this time, B.C. 570, books were made in the form of a roll, and were written on both sides. 'And when I looked, behold, an hand was sent unto me; and, lo, a roll of a book was therein. And he spread it before me, and it was written within and without.[13] Such books were probably composed of linen, and, indeed, it is generally believed that all the Scriptures of the Old Testament were written on linen. Wood, however, long continued to be used for writing, and, as time advanced, it became customary to coat it with wax, so that the letters could be effaced, and fresh writing substituted, without injuring the tablets. The Greeks and Romans, indeed, continued the use of waxed table-books, long after the introduction of papyrus, leaves, and skins: and for many ages the Chinese confined their writing to bamboo.

The letter of the King of Assyria to Hezekiah, B.C. 750, was no doubt composed of linen, parchment, or some kind of skin, as the Jewish monarch is said to have *spread* it before the Lord.

But, between this period and the origin of

[13] Ezek. ii. 9, 10.

letters, there was a great gulf, of which we are unable to trace the opposite shore. We know, however, that at a stated time, man had unravelled the mysteries of language, and possessed the means of giving a permanent form to his ideas. These were the germs of knowledge, and we have now to see what influences operated to develop, amplify, and expand them.

The first condition of society, from its assemblage and foundation, is government. So essential is this to association, that we even find it prevail amongst animals, wherever a number voluntarily exist together. The wild deer, the dog, the wolf, and, descending the scale, the bee and the ant, have each their chief—the recognised head of the community. Man, the lord of all, is equally compliant; and, in consorting with his fellows, surrenders his personal independence for the common weal.

The influence of social government on the individual mind is so decided, and, at the same time, so direct, that it is susceptible of almost mathematical analysis. We may trace it through the long course of history, in every phase of human intelligence: and each advance in the science of government marks a new era in knowledge and civilization.

But a still more potent minister in the great work was religion, operating now for good, now for evil, according as its principles were elevating, gloomy, rigorous, or lax. For a long time, indeed, religion and government were united, vesting their powers in the same hands, and moving through almost the same channels. Originally society found a natural authority in the head of a family, who, as his offspring increased, became the chief, as he was the priest, of a tribe. This form of government still exists in the East, where nomad hordes preserve the usages of primitive times; but though equal to the requirements of a clan, it necessarily failed as population increased, and families merged in communities. Combinations of numbers involve localization, and, as a consequence, association of dwellings, whence it has arisen that the first efforts of organised bodies, after choosing a convenient site, have uniformly been directed towards the building of a city. All the empires of antiquity had their origin in a city, and when we speak of the mighty realms of Assyria, Babylonia, and Phœnicia, it is as Nineveh, Babylon, and Tyre, as, in later ages, we mention Rome, which was to the last rather a capital than a nation. In

primitive times there was no rural population, except among strictly pastoral races, and on the fruitful banks of the Nile. Residence beyond the ramparts of a town, except in strong numbers, was extremely hazardous, as even fenced villages were attacked by predatory bands, and their inhabitants slaughtered, or carried into captivity. The proprietors of lands lived within the walled boundaries of cities, only visiting their farms and vineyards in company with a strong force of labourers and servants, and at certain fixed periods, when the season enforced attention to the soil. To this cause we may attribute the frequent great famines of early times, as well as the incredible extent and populousness of ancient cities, which, in fact, always included a large tract of arable land, as a necessary provision in case of siege. But gradually a more settled order of things was established in Egypt, where a multitude of separate communities, located in different towns and villages, merged into a compact whole, naturally ranging the people in classes, and apportioning to one caste the special duty of cultivating the ground. Here we have the first rudiment of an agricultural population, residing permanently on the soil, except at the period when the swollen Nile,

by its fertilising inundation, forced them to take refuge in the neighbouring towns and villages. Arabia Felix seems to have been similarly settled, at a very remote time, but not with the same security; and we learn that the camels of Job, when he was in the plenitude of his power and authority, were carried off by the Chaldeans, and his servants deliberately massacred.

Through these various changes we trace the gradual progress of government and colonization, successively beholding the patriarchal tent, the straggling village of mud hovels, with its bearded chief, or council of elders, the city and its King, and, finally, the settled country, which, however, was restricted to one or two favoured regions, and only became universal under the modern system of Europe.

The part played by religion in this social progression made itself apparent in every development. Man, in his lowest, as in his highest state, owns the religious influence as a presiding sentiment of nature; and, however he may distort, never wholly discards it. But poor human nature cannot instinctively rise to the spirituality of religion. In the untutored mind there is a continual yearning after the visible, which is all that it can know, fathom,

and comprehend. Thus the pure religion preached by Noah speedily became corrupted; and, in fact, the very means resorted to for preserving its doctrines, by symbols, myths, and sensible objects, operated to obscure, and ultimately to efface it. The worship of a Supreme, Invisible Being was almost lost, while Noah, its apostle and witness, still offered his daily sacrifice on the plain of Nakshivan.

But the primeval governments of the world, however idolatrous, were, nevertheless, essentially theocratic; and, looking back, we can now admire the wonderful providence of God which adapted their very errors to the condition of man. The scattered elements of society called for a vigorous system, which should exercise a moral as well as physical control, and, by the sheer impulse of force, carry the human mind over manifold difficulties. It is true, the ultimate result was to enslave both body and soul, to substitute superstition for religion, and, when a certain point was attained, to arrest progress; but, meanwhile, many obstacles were overleaped, man learnt, as it were, the alphabet of science, and laid the foundations of that great tower of knowledge, which does indeed reach unto the Heavens.

But, before recording the successive advances of intelligence, it may be proper, at this point, to state briefly what was the general aspect of the world, when society first began to take form and order.

In all probability the parent city of the earth was Babylon, supposed to be the Babel mentioned by Moses, *Genesis* x. and xi. Nineveh is spoken of a little later, as having been founded by Asshur, a descendant of Cush, and here, about 2245 years B. C., we discover the origin of the two great realms of Babylonia and Assyria. This corresponds with the computation of Herodotus, who affirms that the empire of Babylon existed about 520 years before its subversion by the Medes, though Berosus, a Babylonian priest, who wrote in the time of Alexander the Great, carries back its history for 150,000 years. Babylon was remarkable for a lofty tower, built of brick, and of great antiquity, which, with other characteristics, seems to mark it clearly as the Babel of Moses. Josephus, indeed, quotes one of the Sybils to prove that it was here, while building a tower of immense height, that mankind were dispersed by a confusion of tongues, and hence the city derived its name. It is not surprising that

the tower should be appropriated to religion, as by its origin and associations, it was a religious monument; and, according to Herodotus,[14] it consisted of eight stories, the highest of which was wholly devoid of images, and was probably dedicated to the invisible God, while the remainder, descending in successive stages, were assigned to the sun, moon, and the five known planets, the perceptible symbols of his power.

The same religious system prevailed amongst the Arabs, and, more or less, over the whole East, so that we find the sun and moon, the planets and the fixed stars, with deified men or heroes, worshipped equally in Babylon, Nineveh, Arabia, Syria, Edom, and Persia. The practice of adoring the sun and moon is mentioned by Job, who appears to have been an Edomite emir; and Ezekiel,[15] writing about 800 years later, describes the prescriptive ritual. From the worship of the heavenly bodies to that of fire, of which they were believed to be composed, the transition was easy; and, from being recognised as a divine element, fire became divinity itself. It is not improbable that Abraham may have been a fire-worshipper, since St. Paul affirms

[14] Herod. I. 181. [15] Ezek. viii. 16.

that he was a Syrian ready to perish; and the word 'Ur,' the name of the land of his birth, signifies fire, or light.

The Chinese, though an ancient people, cannot claim to rank among the primeval nations; and their boastful chronology is unworthy of a moment's credence. They affirm that the world had existed 64,800 years when their first emperor, Ya, was born, and, as a proof of their great antiquity, pretend to have registered an eclipse of the sun as early as 2155 B.C. That this, however, is an audacious invention, we have abundant proof; as they were found to be ignorant of the mode of calculating eclipses when visited by the Jesuits; and, indeed, such a fact is irreconcilable with their total want of ancient records. To account for the default, they affirm that so late as B.C. 246, one of their emperors commanded all books extant to be burnt, unwisely excepting those on law and physic; but their most reliable historian, She-Ma-Tsien, who lived B.C. 37, and professes to have composed his chronicle partly from tradition, and partly from imperfect fragments of works which had escaped the fiery deluge, frankly avows that he was unable to trace back the course of events with certainty

beyond 800 years.[16] At that time the religion of the Chinese, as far as it can be ascertained, corresponded with that of the other Eastern nations, becoming more and more idolatrous in the lapse of ages, till, about B.C. 550, it was reformed by Confucius, who dimly shadowed forth the one true God.

A more remote antiquity may be claimed by the Hindoos, who early made strides in knowledge, only to pause, as if wearied with the march, on the frontier of civilization. Their dark mythology includes whole legions of gods, all resolvable, however, in the first instance, into three principal deities—Vishnoo, Shiva, and Brúmha, into their companion goddesses, Doorgu, Lūkomēē, and Sūrūsūrū; and into the elements. Beneath this gloomy myth we trace the shadow of the awful mystery of the Trinity, disguised indeed, and distorted, but still looming up, as from a grave, after an interval of thousands of years, to bear witness to the original truth and purity of religion.

The kingdom of Persia was little less ancient than Babylon, being mentioned by Moses under the name of Elam as early as 1913 B.C. At that period, however, its

[16] 'Hist. of China.'

extent must have been but small, as the King, with five tributary sovereigns, was defeated by Abraham, at the head of only 318 men; and so late as the accession of the great Cyrus, B.C. 538, the Persian nation comprised only twelve tribes, numbering 120,000 men. They early adopted the worship of fire, as an emblem of the Supreme Being; and continued in this faith till Zoroaster, B.C. 600, introduced a new and more mysterious creed.

Phœnicia, one of the nurseries of civilization, was a nation of the second epoch, and is generally believed to have been a colony of Egypt. Unfortunately for posterity, its national records are lost, or they might throw much light on the history of antiquity: although, extending over a period of 30,000 years, their fabulous chronology must have greatly impaired their testimony. We know that Tyre was a flourishing city in the time of Solomon; but Josephus places its foundation at only 240 years before the building of the Temple, or 1245 B.C. The Phœnicians had then attained a high degree of prosperity: their commerce extended eastward to India and Ceylon; their colonies were planted along the rich shores of the Mediterranean, as far as Marseilles; and

their ships, the source of their success, visited England and Ireland, possibly referred to in the Scriptures under the designation of 'the isles.' Nothing is known of the national religion of Phœnicia, except that, in all probability, it was the germ of that of Greece, her offspring and heir; and, in the guise of Jove, concealed, beneath a mystic veil, or, perhaps, we should say a sealed shroud, the divine truth of a presiding Deity.

It remains only to speak of Egypt, the cradle of the arts, of science, and of knowledge; for, omitting the fruitful shores of the Nile, the residue of the earth was either primeval wilderness, or occupied only by wandering tribes, who entirely depended for subsistence on hunting or fishing. In this condition, indeed, it still remained, a thousand years after civilization had spread along the shores of the Mediterranean, and while the great empires of Assyria, Persia, and Egypt grew up, flourished, and decayed.

Egypt is referred to by Moses as a powerful kingdom at the remote date of 1920 B.C.; and it is universally believed to have been founded by Misraim, the grandson of Noah, and from whom it derived its original name. The history of Manetho, a high priest of Heliopolis

in the time of Ptolemy Philadelphus, B.C. 280, would lead us to believe that it had endured for 53,535 years; and, for a long time, the learned were so bewildered by its numerous dynasties, that their faith in the chronology of Moses, the foundation of general, as well as sacred history, was severely shaken. Time has come forward with other facts to verify the accuracy of the inspired annals. As modern ingenuity has succeeded in discovering a key to the occult language of ancient inscriptions, so modern inquiry, stopping at no obstacle, has unravelled the mystery of the Egyptian dynasties; and we now find that many of the kings were contemporaries, ruling at the same period over different portions of the country, till, at length, the whole fell under one sovereign. This is in keeping with the course of progress and amalgamation traceable in other nations; and it is remarkable that the earliest monuments of Egypt, from which we derive information on every point of its history, go no further back than the era of Abraham,[17] 193 years after the supposed foundation of the kingdom by Misraim. The Shepherd invaders were probably the Israelites, who came from the neighbourhood of Phœnicia, where

[17] 'The Ancient Egyptians,' by Sir Gardner Wilkinson.

the Shepherds are said to have dwelt; and Joseph and his successors, appointed rulers over the kingdom by the Pharaohs, may have been familiarly designated Kings, since they evidently exercised all but regal authority. Their dominion is said to have lasted 250 years, only twenty-two short of the period mentioned by Moses; and, according to Manetho, they then retired in a body from Egypt by way of the desert, penetrated into Syria, and built Jerusalem.

The granite pages of Egypt's monuments reveal to us her Gospel, as well as her history; and hence we derive a clear knowledge of her original religion. The articles of her faith are inscribed on those imperishable tablets, as was the creed of Sinai on the tables of stone, and, reduced to their first principles, we may trace the finger of God equally in both. Osiris appearing on earth for the emancipation of mankind from the dominion of the Evil One, may, without extravagance, be recognised as an image of the true Messiah; and the resemblance becomes more striking when we find that he was put to death, but subsequently returned to life, and became the Judge of the dead. What is this, indeed, but a prophetic view of the future Saviour gradually

come to be regarded as an accomplished fact? Nor is it less startling to discover another sacred and significant myth in the triads, used by the Egyptian priests to represent the creative attributes of the Almighty; and in which the third idea is said to *proceed* from the other two. The belief of the early Egyptians in one supreme Lord, denominated Seb, or Saturn, was, indeed, known to the ancients; and is attested, among other authorities, by Jamblichus, while Plutarch mentions an inscription in an Egyptian temple, which made this awful announcement—'I AM ALL THAT HAS BEEN, IS, AND EVER SHALL BE.' Not more explicit was the declaration from the burning bush,—'I AM THAT I AM.'

II.

THE MARCH OF INTELLECT.

LOOKING back from the remote point at which our history has arrived—forming a platform, as it were, on the brink of time—we obtain a dim view of a very signal fact, vindicating the providence of God, while it attests, in an emphatic manner, the antiquity and unchangeableness of true religion.

There is here evidence that the Creator has at no period left his creatures ignorant of his existence, but has, on the contrary, from the first vividly impressed it on the human mind, imparting also a correct perception of his attributes, and, if one may so speak, of his character. The parent nations seem even to have been acquainted with the divine mystery of the Trinity, and to have had a foreknowledge of a future Saviour, who, subjected on earth to a cruel death, should rise from the grave, and become the Judge of departed spirits. Such incidents necessarily involve a conviction of the im-

mortality of the soul; and there is, indeed, no ground whatever for the general impression that this fundamental doctrine was unknown to the old world.

It is true, the religion promulgated from Sinai is silent on the subject of a future state; but we must remember, as a no less significant fact, that the Almighty was here legislating for a temporal people, specially singled out for a temporal destination. Certain it is, from numerous passages in the Prophets and the Psalms, not to mention the apocryphal books of Wisdom and Maccabeus, that the Jews were sensible of the immortality of the soul; and, indeed, Josephus has left us a detailed account of their views of a future state,[1] corresponding with that so forcibly indicated in the parable of Dives and Lazarus. Both the immortality of the soul, and the coming of the Messiah were known to Job, and who can forget his sublime exclamation?—"I know that my Redeemer liveth, and that he shall stand in the latter day upon the earth: and though, after my skin, worms destroy this body, yet in my flesh shall I see God."[2] A future existence

[1] 'Discourse to the Greeks concerning Hades.'

[2] Job xix. 25, 26.

was also acknowledged by the ancient Egyptians, who, even within the historic era, ferried their dead across the Nile, to receive, before interment, the judgment of a human tribunal, which, usurping the functions of the Deity, consigned the departed spirits to the abodes of the blest or the dismal abyss of the wicked, according as their earthly career had been just or evil. The same eternal truth was everywhere preserved in the myth of the Elysian fields and the infernal regions; and was loudly proclaimed by the wise Greeks.

We have now to inquire how it was that ideas so generative, constituting the root of all knowledge, and, by their very nature, giving vigour and freedom to the intellect, should in a few ages have become so mystified, obscured, and defaced, that they may be said to have been wholly lost, while, at the same time, philosophy and science, after making a prodigious stride, came to a stand, remaining motionless and paralysed, as if the pulse of the human mind had been suddenly stopped, its great faculties entranced, and its light put out.

Too easily indeed is the mystery explained. In an infant society, having before it a mighty mission—the colonization and recla-

mation of interminable wastes, the founding of communities, and the building of cities, without implements, without arts, without any physical knowledge—mankind, as already shown, naturally fell into the arrangement of castes, which severally undertook a distinct part in the work. Thus the great mass became exclusively occupied in manual labour; a more select class devoted themselves to the military art and the exercise of arms; and study and intellectual pursuits, with the ministrations of religion, devolved on the priesthood, who, of necessity, were thus the depositaries of all knowledge, and the controllers of the intelligence, as well as of the conscience, of the human family.

The priesthood being hereditary, the precious treasures of knowledge became its patrimony, to which each individual of the caste succeeded as his birthright, and as a perpetual, inalienable possession. Here we have the form of the first aristocracy, an aristocracy of intellect, founding its entail in the human soul. How was this great charter of its existence to be preserved?—by what guarantees, and what authority? There must have been a continual fear that the vast herd of men, now engrossed by colossal

undertakings or desperate wars, would one day break through the slender bound of caste and burst into the treasure-house. There must have been an incessant apprehension of the might and progressive tendency of human thought. The priests must have dreaded to see their domain invaded, their power undermined, and the rich heritage they had obtained wrested from their descendants.

But they held in their hands all the elements of security, and these they were not slow to use. By his diversion to physical employments, man had become ignorant, and, as numbers multiplied, his ignorance was allowed to grow, to spread, and to take root. The arcana of knowledge were kernelled in cabalistic characters, comprehended only by the priests themselves; the vital truths of religion were buried in the same obscurity; and the very majesty of God was veiled by mystic symbols, so intricate and perplexing, that, in course of time, even the initiated were probably unable to fathom and solve them.

Yet, as already intimated, the union of priestly and temporal domination, vesting this theocratic government with both spiritual and material attributes, was, in the first instance, not unfavourable to mental develop-

ment, inasmuch as it carried human ingenuity over numerous rudimentary difficulties by sheer physical force. Hence we find a high state of civilisation at a very early period, particularly in the nascent kingdoms of Assyria and Egypt. Regal palaces, imposing alike by their magnitude and their architecture, rose with magic rapidity, and still preserve on their ruined walls the handiwork of the primeval sculptor, and even the brilliant colours of the painter. These tableaux delineate the social history of the period, in all its phases, and all its varieties. They carry us into the King's chamber and the priest's closet: they depict the manners, customs, and smallest incidents of domestic life; they show us the advanced state of the arts and manufactures, the costume, the diversions, the various pursuits and the general habits of the population. We discover that a degree of taste, and even of refinement prevailed; that the houses of the rich were fitted with sumptuous furniture, and embellished with works of art; and, finally, that the business of life, instead of occupying undivided attention, was relieved by social intercourse, such as Eastern etiquette of the present day could never be brought to sanction.

If we pass to the more primitive region of Arabia, we learn, from the book of Job, that civilization was not confined to the voluptuous cities of Egypt and Assyria. Job is described by the Seventy as the grandson of Esau, which places his era at about B.C. 1650. His history, while disclosing a primitive condition of society, indicates considerable acquaintance with the arts and sciences, and is itself an imperishable monument of literary ability. Whether or not Moses is to be regarded as the author, it is undoubtedly a faithful picture of the sentiments and opinions, as well as the social aspect, of a very primitive epoch, revealing the latter, indeed, rather by incidental allusions than by direct statements, and thus ever preserving that simple perspicuity which is the peculiar characteristic of Scripture history.

The first branch of knowledge to which human ingenuity would be directed is mathematics. At the base of this parent science lies arithmetic, or the art of computation, which is, speaking comparatively, as necessary to the operations of the mind as sight to the body. Numbers are, in fact, the guide, the light, the eye of science. Without them we could do nothing and understand nothing; for

no fact could be made plain and comprehensible. They are to philosophy what letters are to language, and, by a simple effort of memory, fix on the mind definite and precise ideas, just as objects are imprinted by a stereoscope; so that, by their aid, the otherwise narrow capacity of our faculties is illimitably enlarged, and we are able to extend our calculations beyond the gauge even of imagination and conception.

Numbers are so necessary to thought and reason, and so intuitively arise from consciousness, that they must have occurred to man on his first creation. The fingers on our hands, the toes on our feet, the objects around, the stars overhead, all suggest reckoning and computation. Nevertheless, a considerable period elapsed before arithmetic made any progress. If we are to believe historians, commerce was widely diffused while the art was yet in its infancy; and its invention is attributed by Prochus to the Phœnicians. Josephus, with more probability, carries it back to a remoter date, and affirms that Abraham introduced it into Egypt, B.C. 1900.[3] The numerals used were the letters of the alphabet, which, indeed, we still largely adopt

[3] 'Antiq. of the Jews,' I. 10.

representing figures by Roman letters. The alphabet thus becomes the voice of the mind, giving its calculations form and expression, while, at the same time, it is the vehicle of language. Arithmetic was a favourite science with the Egyptians, who greatly improved and extended it, and, being especially cultivated by the priests, it was ultimately consecrated to religion. The sacred numbers of four, seven, and nine, by endless transformation and involutions, were then used to typify the awful mysteries of Trinity and Unity, and hence we derive from them further evidence of the antiquity and perpetuity of that divine creed.

According to Kircher,[4] the Egyptians explained everything by numbers. It was in the society of Egyptian priests that the art was acquired by Pythagoras, who, about B.C. 520, introduced it into Greece. But arithmetic, as a science, appears to have been quite unsuited to the genius both of the Greeks and the Egyptians, since for many ages it remained stationary; and ultimately it was on its native soil of Arabia that it attained its full development. It is the Arabic system of notation that is now in use,

[4] 'Œdip. Egypt.'

and this was introduced so late as the eleventh century of the Christian era, or only eight hundred years ago, when, its superiority being apparent, it was universally adopted.

Possibly we owe to Arabia also the sister science of algebra, which, by a process somewhat analogous, but more refined in its character, conducts to results which aid in determining the relations of magnitude in different quantities. The amounts are, as in arithmetic, denoted by symbols, but while numerals are used in one case, in the other the quantities are expressed by the characters of the alphabet; and this notation extends to the quantities unknown, or which it is required to discover, as well as those which are stated. At first sight, the distinction between algebra and arithmetic appears simple; but though both may be traced to the same original principles, they have each a special province. And the difference may be appreciated from the fact, that arithmetic, working on positive data, yields the separate values of the quantities sought, while algebra, after expressing the several amounts comprehended in a problem by specific characters, extends no further than to show the particular opera-

tion applicable to the original given quantities, as a means of ascertaining their values.

By some writers, algebra is said to have been known to Thoth; and this, taken in connection with its affinity to arithmetic, justifies its mention in the present chapter, though its chronological place might seem to fall at a later date. Certain it is that we have no authentic notice of the science till A.D. 350, when Diophantis, an arithmetician of Alexandria, produced an algebraical work; but this very book affords strong presumptive evidence of the antiquity of the science, inasmuch as it comprises a number of intricate questions, with their solutions, and there is no reference to elementary instruction. Nor are historians agreed as to the era of Diophantis himself, who is said by some to have lived in the reign of Augustus, B.C. 27. There is ground for believing that algebra was known in the East at a much earlier date, and passing westward from India and Persia, was assiduously cultivated by the Arabians, who finally—though not till about the ninth century of our era—introduced it into Europe.

But arithmetic and algebra are but ele-

ments of the great science of mathematics, which comprehends, in one circle, all that relates to the ratio and comparison of quantities, and the proportion that such quantities bear to each other. It may, consequently, be described as a series or uninterrupted succession of principles, reasonings, and conclusions, following in such order as to rise from each other as a necessary sequence, indicating their accuracy and infallibility. Every relation of the comparison of magnitude, as numbers, velocity, distance, falls in the scope of mathematics; and, on every question, precise results are deduced, a determinate quantity being invariably fixed as a standard of measurement.

But the application of mathematics is by no means to be confined to the ordinary pursuits of man and society. Their operation on the faculties of the mind, by induction, by comparison, and by calculation, is not indeed to be estimated, for it is absolutely beyond the reach of observation, and almost of conception. We cannot contemplate this science without being affected by its grandeur, its elevation, and its sublimity. By its principles we are enabled, without hesitation or difficulty, to measure the earth, to span the ocean, to

gauge the atmosphere, and explore the heavens. By this preceptor we are initiated in the mysteries of nature and of our own being, and while we take it as a guide in the familiar incidents of life, ever passing from cause to effect, and from effect to cause, it opens our understandings to the wonders of creation, and to the prodigious laws which sustain the universe. But the most salutary result is, that the same exercise which enlarges our intelligence, restrains and holds back our imagination, so that, by a process strictly methodical, we arrive at deductions not more sublime from their magnitude, than from their exquisite truthfulness and harmony.

So obvious was the high moral effect of mathematics, in the training and expansion of the faculties, that the Greeks designated the science by a word signifying *discipline*, as indicative of its character and tendency. That name it still retains, and modern experience daily attests its aptness.

Mathematics may be ranged under two heads, which have come to be described as *pure* and *mixed*. The former, based on the simplest ideas of quantity, comprehends Arithmetic, Geometry, Algebra, and the direct and inverse method of Fluxions; while the latter

directs the application of the pure science to certain established physical principles, and, in point of fact, comprises all the physico-mathematical sciences, including Hydrostatics, Optics, Astronomy, Acoustics, Electricity, Magnetism, and Mechanics.

It is reasonable to conclude that at no period could the human understanding have been unconscious of the use of the properties of extension, one of the fundamental principles of mathematical science, leading us to ascribe to Geometry, as to Arithmetic, an origin almost coeval with man. Some perception of the rudiments of geometry was indeed absolutely necessary, before the first architect could construct a house, or families mark out their land. Such pursuits unavoidably developed the properties of extension and figure, as expressed in the prolongation of lines, surfaces, and solids, from which geometry took its rise. Its cultivation led to the application of these principles to artificial representations, or diagrams, as well for the investigation of the relation of figures to one another, as, in union with certain ascertained analogies, for the demonstration of the properties of magnitude in the abstract. Starting from the data of a question, this analysis derived from its

source a set of necessary consequences, which in their turn became data, originating another series of conclusions, till, by successive stages, all following the same method, that result was obtained which clearly defined the solution of the question. Such a process was highly creditable to human ingenuity, and might almost be considered as a ladder of knowledge, on which, by careful treading, it was possible to ascend to any height. But, in truth, its structure was far from perfect; for in an intricate problem, the data might easily include a hidden contradiction, and this would pervade all the lines, angles, and figures on which the geometer had been working, and which, though serving as symbols, bore no real resemblance to the objects they were supposed to represent. Here we discover the primary defect of the ancient philosophy, kernelled in its root; and a simple misconception of the characteristics of mathematical analysis confused the whole human race.

The Greek designation of geometry describes it as the science of measurement, and no doubt accurately indicates the use to which it was first directed. It is said to have originated in Egypt, at a very early period, as a consequence of the inundation of the Nile,

which, by removing boundaries, annually necessitated a new division of the land. But it must have been known prior to the colonisation of Egypt; and if not taught by Noah, who applied its principles to the construction of the Ark, was certainly understood by the builders of Babel. Herodotus, indeed, gives the honour of the invention to Egypt, and considers that it was first practised in the reign of Sesostris, when the kingdom of the Nile was traversed by numerous canals, carrying the fertilising waters to every quarter. His words are: 'Hence land-measuring appears to me to have had its beginning and to have passed over into Greece.'[5] But the higher authority of Moses, who was so versed in Egyptian history, seems to place the art as early as the era of Peleg, the grandson of Shem—'for in his days was the earth divided;'[6] and this patriarch was doubtless a contemporary of Thoth, who was the grandson of Ham. That geometry was unknown to Thoth, it is difficult to believe; for though Aristotle ascribes the invention to the Egyptian priests, without naming an epoch, it is indubitably clear that it formed a branch of Egyptian lore in the

[5] Herod. II. 109. [6] Gen. x. 25.

remotest times, the triangle, a figure marking some proficiency in the science, being apparent in the oldest pyramids, while the square may be traced in vestibules and doorways, and the obelisk presents the cone.

But, notwithstanding these signs of progress, the Egyptians had really but an imperfect knowledge of the principles of geometry, since Plutarch relates that Diogenes Laertius, on visiting Egypt, astonished the learned King Amasis by measuring the height of the obelisks by their shadows. Could we suppose, indeed, that the science of geometry had been lost from the time of the Flood to that of Thoth, and thus assign to Egypt the merit of its recovery, we must yet award to Greece the proud distinction of having both developed and extended, while she more accurately applied it. But the truth seems to be that geometry was known to the Greeks before the date of its alleged introduction by Thales. Some of the properties of the triangle, the rudiment of the Egyptian science, are said to have been discovered by Euphorbus of Phrygia; the square and the level have been attributed to Theodorus of Samos; and the compasses are thought to have been invented by Talus. This youthful philosopher was the

morning star of Greece, and the nephew of the great Dædalus, who, according to the ancient chroniclers, was so jealous of his attainments, that he threw him from a window, or, as some accounts assert, from the ramparts of Athens, killing him on the spot. But, whatever the success of Talus, the geometry of that early period must have consisted but of bare ideas, rising less from method than instinct; and could scarcely be denominated a system. The constructor, the father of the science was Thales, who lived about B.C. 580, and deservedly takes rank among the Seven Wise Men of Greece. Thales was so devoted to the pursuit of learning, that he could never be persuaded to marry, finding a bride in knowledge; and when, on attaining manhood, he was urged by his mother to take a wife, he excused himself on account of his youth, while, at a later period, he declared that he was too old. Following the custom of early sages, he sought to improve his understanding by visiting distant countries, and, among others, Egypt attracted him to her schools. Here he is said to have accomplished the same feat which Plutarch records of Laertius, in the measurement of the height of the obelisks,

and it is certain that he made himself perfect master of all the Egyptian philosophy, including, of course, its crude system of geometry. This he transplanted to Greece, and in that fruitful soil, it took root, still fostered by his diligence and genius. During a life prolonged over nearly a century, the venerable philosopher never ceased to devote his faculties to the advancement of science, and, to his assiduous studies, we owe various expositions of the latent properties of the circle and the comparison of triangles. In such intricate and beautiful speculations, exercising the highest faculties of human reason, his mind found endless enjoyment; and one of his greatest achievements in geometrical science, the discovery that all angles in a semicircle are right angles, so gratified and elated him, that, in the fervour of his joy, he offered a sacrifice to the Muses for the benign inspiration.

The destinies of the human mind, as of nations, are in the hands of great men, who rise up, in their several centuries, like landmarks, plainly indicating the successive advances of intelligence, the accessions of soil continually reclaimed from the virgin wilderness. Such is the rank we assign to Thales. Far off, on

the very horizon of time, where history melts away in traditions and legends, his figure stands out in clear relief, arresting us by its distinctness, its stature, and its symmetry. We recognise one of the great master-spirits of our race. We see him ever bent on one mighty absorbing object, the pursuit of learning and truth—seeking it wherever it might be found, in his own breast, in his closet, in distant lands, braving the innumerable hardships and dangers of travel, of the desert, and of the sea, venturing his person among strange nations, and shrinking from no toil, so that he may reap the precious harvest. Solitary and studious, seemingly rapt in contemplation, and living in a world of abstractions, he is alert on occasions—observant as Newton of the physiognomy and phenomena of nature, and equally withdrawn from the common sphere of men. He is seeking to penetrate the abstruse problem of his being, to resolve the elements, and account for the existence of matter, to discover what is before and what behind, and whither it all tends. Yet, if his thoughts are given to philosophy, his sympathies are with mankind. He is a missionary of the useful arts, of morality, and of virtue. No crabbed, churlish cynic, he can dispense

with the pleasures of life, without contemning their use by others; and we discern a kindly smile on his face, and a merry twinkle in his eye, as, replying to his mother's exhortations, he announces himself now too young, now too old to marry. He was a philosopher by inspiration, before schools and systems began.

Geometry acquired a further development from Pythagoras, who, equalling the acumen of Thales, solved the problem of the square of the hypothenuse, which forms the 47th proposition of Euclid's *Elements*. Like his great predecessor, he commemorated his discovery by a hecatomb to the Muses; but as his religious principles, embracing the doctrine of the transmigration of souls, prohibited the taking of life, his sacrificial oxen were formed of wax, thus effecting his object without the effusion of blood.

No one contributed so much to form and mature the growing science as Euclid, a mathematician of Alexandria, who established a school in that city about B.C. 280. Possessing a mind eminently practical, he was attracted by a study that interested, while it continually exercised his peculiar faculties, at the same time that it opened a wide field for inquiry. The demands of tuition required that he should

be conversant with the labours of previous geometers, as well as unremittingly engaged in fresh investigations; and, by this incessant application, he eliminated the fundamental principles of the science, added many new problems and demonstrations, and reduced the whole into a system. The result was embodied in his celebrated *Elements*, originally consisting of thirteen books, but afterwards—though not till the lapse of two centuries—increased by Hypsicles to fifteen, and enriched with additional problems by Theon, and other adepts. Euclid carried his researches into every branch of mathematics, especially devoting himself to arithmetic, astronomy, and optics. Among his pupils was King Ptolemy, who was extremely desirous to excel, but, becoming weary of the study of the *Elements*, asked his preceptor if the science could not be acquired by some easier method. The philosopher curtly replied, 'There is no royal road to geometry;' and Ptolemy, easily convinced, was content to follow in the beaten track.[7]

But, though great honour is due to Euclid—though it was his hand that consolidated geometry, and gave it elevation and form, the

[7] V. Ma. viii. Ci. Or. iii.

highest place amongst ancient mathematicians must be assigned to Archimedes, their prince and chief. This renowned philosopher was born at Syracuse, B.C. 286; and, eager to view nature and art in other countries, repaired to Egypt for his academic initiation, so that he may have received his first lessons in the school of Euclid. After an interval of several years, he returned to his native city, and applied himself diligently to geometrical studies, when, among other demonstrations, he succeeded in squaring a curvilineal space. The Alexandrian mathematicians had just sanctioned the introduction of conic sections; and the field thus opened, apparently without limit, was immediately explored by Archimedes, who entered on a measurement of the new figures, together with some of older date, and finally determined the relations of spheres, spheroids, and conoids to cylinders and cones, and the relations of parabolas to rectilineal planes. But his most subtle demonstrations refer to the circle, whose magic and perfect form he dissected in every part. He ascertained that a circle is equal to a right-angled triangle, whose base corresponds with the circumference, and whose altitude is equivalent to the radius; and hence that its area is equal

to the rectangle of half the diameter and half the circumference.[8] There was no way of obtaining the precise quadrature, as it depended on the rectification of the circumference, and this, after exhausting his calculations, he was unable to educe; but he came to the conclusion that the quadrature is to the square of the diameter as 11 to 14,[9] an approximation to the truth which has been found of considerable service. He traced the proportions of the circle still further, by determining its relations to the ellipse; and wound up his geometrical discoveries with the measurement of the spiral.

It is surprising that, with such missionaries at its call, ancient philosophy was still radically infected by error, by a neglect of the process of reasoning, arising from an obstinate preference of speculation to experimental knowledge. Hence its development was abortive and paradoxical. Assuming premises, and working upon them as facts, without proceeding to demonstration, it accomplished many practical results, while wholly misconceiving the principles on which they were based. This is especially observable in Mechanics—a branch of mathematical knowledge exacted by our phy-

[8] 'Dimensions of the Circle.' [9] Ibid.

sical wants, consequently deriving many suggestions from instinct, but which nevertheless involves in its practice some of the most subtle mysteries of nature.

Mechanics may be described as a science founded on the laws of equilibrium and motion, as they affect, in their operation, all descriptions of bodies, whether solid, fluid, or aeriform; and it reveals the innate forces by which these bodies may be made to act upon each other, indicating the means of developing and increasing the amount of power, so that the weaker, by an accession of energy, may be made to overcome or counteract such as are primarily more potent.

Such a science must, so to speak, unfold itself—divulge its laws and principles by degrees, and even by accident, unless when investigated by the scrutinising eye of modern philosophy. Yet, as we have just remarked, mechanical contrivances are among the first requirements of man, even in a savage state; and it follows that necessity, as the mother of invention, would shape out rude machines for urgent purposes, by mere intuitive tact. The architects of Babel and Nineveh, of Memphis and Thebes, were obliged to resort to mechanical appliances of incredible force, in order

to raise to immense heights the huge blocks of stone which we discover on the summit of their buildings, like a crown of adamant; and, among these machines, we find the lever, the crane, the pulley, and the capstan. The hammer and wedge are of still remoter origin, and we may conclude that nearly all these instruments were a legacy from the antediluvian world, preserved by Noah in the Ark. Nails were probably made originally of wood, but at a very early date they appear in copper, in the most ancient remains of Nineveh, showing that, if ever disused, Tubal Cain's knowledge of the working of metals had not been lost. The invention of the axe and wimble has been ascribed to Dædalus, who, continuing his mechanical studies, is said to have originated also the level, the wedge, the axe, the plummet, and the gimlet.[10] But modern researches attest that both the level and wedge were known in Assyria and Egypt long prior to the age of Dædalus, and the inference is that the Athenian philosopher, instead of being their inventor, only introduced those implements into Greece. It is not clear that either the Assyrians or Egyptians were acquainted with the saw, which, therefore, we may owe, with the

[10] Pliny, lib. vii. c. 57.

rich gift of the compasses,[11] to the versatile genius of Talus. Glue was introduced either by Talus or Dædalus, and the square, the turner's lathe, and the key by Thiodorus of Samos.[12]

In the infancy of mechanical knowledge, man derived many suggestions from the fluctuations and configurations of shadows. The purpose they were made to serve by Thales, we have already described; and it is likely that they had been previously applied to the measurement of time. The first positive mention of such application, indeed, is not till about seven centuries before Christ, when we are told of 'the sun-dial of Ahaz,'[13] but it seems to be alluded to by Job, xiv. 2.—'He fleeth also as a shadow;' and the Greeks award the invention of sun-dials to Anaximander. Indisputably we owe to shadows the suggestion of the primary astronomical instrument, the gnomon. Day by day, some venerable Chaldean sage, revolving the problems presented by the varying aspect of the heavens, may have noticed the gradually decreasing shadow of some well-defined crag, which threw its outline on the plain; and as the length of the

[11] Chron. ii. 11. [12] Pliny, lib. vii. c. 57.
[13] 2 Kings xx. 11.

noon-day reflection continually diminished, the nearer the sun advanced to a vertical position, he must have been finally led to connect it with the northern and southern motion of the sun, with the line of the great luminary's orbit among the stars, and, consequently, with the length of the year, which had previously been only rudely indicated by the returning seasons. At the same time, he would seek to mark these results by a more accurate registry; and a long, sharply-pointed pole, planted on a level space of ground, would at once present the coveted medium and secure the accuracy he desired. Here we obtain the conception of the gnomon, by the aid of which the most signal results have accrued to human intelligence.

The oblique direction of the ecliptic, or sun's route in the heavens, which was defined by the gnomon, could not be kept before the mind's eye without a visible model; and this difficulty prompted the construction of a brazen circle, attached to a similar circle of the same magnitude, at an angle precisely corresponding to the inclination of the equator to the ecliptic. The solstices and equinoxes were also crossed by circles, perpendicular to the equator; and a central axis, in the same perpendicular rela-

tion to the equator, and with its prolongation piercing the north star, supported the whole fabric, which thus revolved in a manner resembling the heavens, furnishing mankind with the second astronomical instrument, the sphere.

The familiar mechanical contrivance of scales is of great antiquity; and is plainly described by Job.[14] 'Oh! that my grief were thoroughly weighed, and my calamity laid in the balances together.' Scales are referred to, without being actually mentioned, in the time of Jacob, when Joseph's brethren inform his steward that their money is 'full weight;'[15] and even 200 years earlier, Abraham is said to have 'weighed' the shekels of silver with which he bought the cave of Machpelah from Ephron the Hittite, B.C. 1897.[16] In the journey of the Patriarchs to Egypt the money is described as being in 'bundles,' which, conjoined with the circumstance of its circulating by weight, may indicate that it was composed of pieces of metal, tied together, and not of coin. Another mechanical achievement of remote antiquity was the weaver's shuttle, picturesquely cited by Job, 'My days are swifter

[14] Job vi. 2. [15] Genesis xliii. 21.
[16] Genesis xxiii. 16.

than a weaver's shuttle;'[17] and it is certain that the beautiful art of weaving, one of the first conquests of civilization, was carried to great perfection in ancient Babylon. The temptation of 'a goodly Babylonish garment' sapped the integrity of Achan, a warrior chief of Israel; and caused the destruction of himself and his family.[18] The produce of Egyptian looms was in almost equal demand, and was conveyed by Phœnician merchants and Midianite caravans to the most distant countries.

Mechanics could not have been pursued for any considerable period, before practical men must have divined the motive power of water, and brought it into requisition as a mechanical agent. The precise epoch of the introduction of water mills is beyond the range of history. Corn, however, continued to be pounded in a mortar long after the fabrication of water mills, and both processes were adopted by the Romans. The windmill is a comparatively modern invention, and it was not till after the first crusade that it was brought from the East to Europe.

One of the most ingenious mechanical contrivances of antiquity was the glass sphere of

[17] Job vii. 6. [18] Joshua vii. 21.

Archimedes, which presented, in a crystal frame, a miniature view of the structure, movements, and whole mechanism of the heavenly bodies, constructed with admirable precision. This exquisite model is highly eulogised by Claudian :—

'When in a glass's narrow sphere confin'd,
Jove saw the fabric of th' Almighty mind,
He smil'd and said, Can mortals' art alone
Our heavenly labours mimic with their own?
The Syracusan's brittle work contains
Th' eternal law that through all nature reigns;
Fram'd by his art, see stars unnumber'd burn,
And in their courses rolling orbs return.
His sun through various signs describes the year,
And every month his mimic moons appear;
Our rival's laws his little planets bind,
And rule their motions with a human mind:
Salmoneous could our thunders imitate,
But Archimedes can a world create.

Among the most ancient agricultural machines we must include the winepress, to which frequent reference is made in the Scriptures, and which must have been known, in some rudimentary form, to the great vintner of Nakshivan, the patriarch Noah. The most primitive construction seems to have consisted of a bag, compressed by two poles, which, revolving in opposite directions, squeezed the juice from the bag into a vessel below, completing the process without difficulty. Wine-

presses of a more complicated character are found on the Egyptian monuments, but they indicate no advance in theoretical knowledge.

Musical instruments, the oldest of human inventions, stand in a double relation to mechanical science, first as pieces of mechanism, and, secondly, in connexion with acoustics. There is good reason to conclude that music had made considerable progress during the long interval that elapsed from its invention by Jubal to the Flood. The science of harmony addresses itself to every genial mind, comes to us from the lips of nature, from the tuneful warblings of the birds, from the modulations and cadences of the human voice. The shepherd's pipe, the first breath of music, trilled forth its notes in the world's morning, as they may still be heard in the East, on the very plains where Noah trained the vine; and it was to such music, as we learn from Job, that the swains and maidens of the patriarchal age mingled in the dance—

'They trip merrily to the sound of the pipe.'

Laban reproaches Jacob for quitting his territory clandestinely, which prevented him from celebrating his departure 'with mirth and songs, with the tabaret and harp;' and the concert of musical instruments is soon

swelled by the trumpet, nabel, psaltery, lute, dulcimer, lyre, and timbrels. The timbrels and harp appear to have been appropriated more particularly to religious services; and the prophetess Miriam, the sister of Moses, on the occasion of the passage of the Red Sea, went forth 'with timbrels,' in a dance. They were, however, used also at festive celebrations, when no religious service was in view, and the ill-fated daughter of Jephthah is stated to have met her father 'with timbrels and with dances.' Timbrel-players are depicted, with other musicians, in the Egyptian tableaux: and the lyre is a common device in those of Assyria. The Assyrian orchestra, indeed, appears to have comprised a great variety of instruments, as it is emphatically described by Daniel as composed of 'the cornet, flute, harp, sackbut, psaltery, dulcimer, and *all kinds of music.*'[19]

But, notwithstanding the number of musical instruments, acoustics, as a theory, was very imperfectly understood. As in the other sciences, practical knowledge preceded theoretical—that is, facts were known, and results obtained, before there was any correct perception of the primary cause. The invention of

[19] Daniel iii. 5.

the lyre must soon have led to the discovery that, at the touch of the player, musical strings yield a sharper and more penetrating note, according as their effective length is diminished, or their tension increased; but no attempt appears to have been made to ascertain, by experimental inquiry, what was the precise relative proportion of length to the various notes of music. The few ideas prevailing on the subject were without form and void, till about five centuries before the Christian era, when the keys of sound, the ratios between various notes and tones, were exactly ascertained by Pythagoras. The process by which he arrived at his conclusions must now be a matter of conjecture, as the account transmitted in ancient chronicles is veiled by fable, but we may conceive, from the tenor of modern experience, that it was by the aid of some instrument, the strings of which were susceptible of contraction or extension at the will of the player. This was but an initiatory lesson in the melodious science, and for two hundred years it made no advance. The great Aristotle, who observed and noted every natural phenomenon, was the first to comprehend the real nature of the laws of sound, affirming that the number of vibrations per-

formed by strings, or by air in tubes, is in graduated proportion to their length, and that corresponding vibrations in the atmosphere communicate the sounds to the ear. Here we have the rudiment of the Newtonian theory, which, based on positive experiment, and on all the arcana of modern science, only developes the principle which Aristotle enunciated. But, in the days of antiquity, nothing was added to the Stagyrite's discoveries, and, in fact, they were themselves swept away by the deluge of the dark ages, though his works, becoming, as it were, a literary Ark, preserved much of his knowledge to our latter world. For long centuries, however, these precious writings were hermetically sealed by an unknown tongue, and, even when studied, were misunderstood, so that the discoveries made by the ancients in acoustics were practically lost to mankind, till they were again wrested from nature by the genius of Guido.

Aristotle fixes the boundary between ancient and modern philosophy; and, from the elevation of his genius, he was able to look forward into the future, the land of promise which opened to his view, but not to his tread. This eminent philosopher was born at Stagira, B.C. 385; but on the death of his father, he

proceeded to Athens, and attended the school of Plato. It may be painful to admit that the eloquence and example of his great preceptor could not wean him from the dissipations of the city, and he often deserted the groves of the Academy for the circus, the theatre, or the boudoir. Nature, however, reclaimed her lover from scenes and pursuits so foreign to his destiny, and which he was not constituted to engage in. Aristotle was denied the advantage of personal attractions: his countenance, instead of being an index to his mind, was mean and deformed; and his personal appearance bore no outward sign of the mighty soul within. This may have turned him from the path of pleasure, and led him for consolation into the closet of his mind; but, whatever the cause, it is certain that, while still in the flush of youth, he assiduously resumed his studies, and sought no other mistress than Science. He became abstemious in his mode of life, ate with frugality, and in order that he might pass but little time in sleep, always reposed with one arm dropping from the couch, the hand holding a ball of lead, which, by falling into a brazier beneath, broke his slumbers. For twenty years he listened to the instructions of Plato, and earned from the

Athenian sage the flattering appellation of *Philosopher of Truth.* His studies extended to every branch of knowledge, as well as all the lore of previous ages, which, crude and undigested hitherto, his logical mind first brought into one mass, and reduced into a system. So great was his fame, that Philip of Macedon hastened to secure his services as the tutor of Alexander, and the letter conveying the royal overture is still extant. 'I inform you,' writes the warrior King, 'I have a son. I thank the gods not so much for making me a father, as for giving me a son in an age when he can have Aristotle for his instructor. I hope you will make him a successor worthy of me, and a King worthy of Macedonia. Faithfully did Aristotle fulfil the honourable and sacred trust; and, according to Plutarch, Alexander derived more advantage from his instructions than from the splendour and regal power bequeathed to him by Philip. The writings of Aristotle, traversing the whole circle of human learning, are numerous; and embracing the accumulated treasures of early science, so largely augmented by himself, form the richest bequest of antiquity.

The Stagyrite was not correct in his con-

ceptions of dynamics, in which, indeed, he has but handed down to us the theory of the ancients, without any infusion of original ideas.[20] In so far, his various propositions are to be regarded as showing the state of the science in the earliest ages. They comprise only a few vague generalities concerning the principle of motion and the nature of equilibrium, not more obscure than fallacious, and confine themselves to mere elementary knowledge. Yet, in one passage, the philosopher seems to have a dim perception of the law of gravitation, affirming that heavy bodies descend to the centre of the universe, and that the velocity of their descents is in the ratio of their weights. But ancient science, though it could jump at conclusions, rarely groped for the cause, and in the greatest days of Greece, there was no meditative Newton to solve the problem of the falling apple. Far from penetrating such mysteries, Aristotle was perplexed by the spectacle of a small power, through the medium of the lever, moving considerable weights, in addition to the intervening weight of the lever itself; and could only explain the phenomenon by assuming, what was

[20] Questiones Mechanicæ.

wholly false, that the motive force impelled the lever with greater facility, in proportion to its distance from the fulcrum, considering that it was diffused through a larger space, because the end furthest from the centre described a greater circle. By a curious mode of reasoning, the shorter arm of the lever was declared to operate with more power on superior forces, or what naturally exceeds it in resistance, than the other; and this vague definition remained unshaken till the science was based on new and more durable principles by Archimedes. Even then, dynamics can hardly be said to have advanced; and the primary law of motion was unknown. The great Syracusan, by his natural sagacity rather than experiment, ascertained the true proportion of the force employed by certain machines to the resistance in the case of equilibrium; but he evinces no knowledge of the principle of the composition of forces, in respect to the precise conditions of equilibrium in machines of every description. On the other hand, it is almost certain that he was not cognisant of any means of calculating the motion of bodies, and instead of believing that it was naturally uniform, and rectilineal, concluded, with the primitive philosophers,

that it must be circular, the circle being regarded as the prescribed form of every revolution of nature. The science of dynamics, indeed, remained stationary, and we are at a loss to comprehend how the Romans could have constructed such complicated machines as those described in the pages of Vitruvius, when we find that it is only recent times—so recent as the middle of the seventeenth century—that discovered the law regulating the mutual collision of bodies. This, after an unsuccessful investigation by Des Cartes, was simultaneously accomplished by Wren, Wallis, and Huygens, to whom the task had been confided by the Royal Society, and the dynamical enigmas of ancient and latter times were now swept away, leaving exposed the broad foundations of the whole science, as regards both equilibrium and motion. But Archimedes, without solving the law, fully understood the powers of the lever; and his well-known challenge to Hiero, to give him a place to stand on, and he would move the world, is an imperishable exposition of his opinions. During the siege of Syracuse, levers and cranes formed his most effective artillery, and, with their aid, the Roman galleys, on nearing the city walls, were raised

from the water, and dashed in pieces on the rocks, while the more distant were reached by his burning-glasses, and enveloped in flames.[21]

Hydrodynamics, which is also a branch of mechanical science, was better understood by the ancients, and as widely practised. It refers to bodies in the fluid condition, in the phenomena exhibited by pressure, equilibrium, cohesion, motion, and resistance, showing, in a precise and definite manner, how the laws of these varied forces must be applied to the construction of machines, in connexion with water, whether the object be to raise the limpid element from a depth, or to use it as a first mover or primary agent. This great river of knowledge parts, as it were, into two streams, the one comprehending all that relates to pressure, equilibrium, and cohesion, and which is called Hydrostatics; the other affecting the actual motion of fluids, the resistance they offer to moving bodies, and their application to mechanical power, and which bears the appellation of Hydraulics.

An apt illustration of the knowledge acquired by the ancients of the motion of fluids is furnished by the Clepsydræ, or water-

[21] Hist. of Rome.

clocks, which were constructed on the principle of regulating the passage of the water by the size of the emitting aperture, and by the dimensions of the superincumbent column. As water-clocks preceded the invention of sun-dials, they prove that some of the leading doctrines of Hydrodynamics were perfectly understood at a very remote era. The form originally assumed by the Clepsydræ presented two inverted cones, the uppermost solid, and the other, which contained the water, hollow, and marked down its length into twelve equal divisions, which, as the fluid descended, announced the flight of the successive hours. The momentum was imparted by the solid cone, and, according to the depth of penetration attained by this primitive pendulum, the flow of the water was more or less rapid—the clock was fast or slow!

The shadoof, in the form still used in Egypt, is another specimen of the hydraulic science of the ancients. It is such a machine as might be expected in a rude age, when man was but little raised from barbarism, being composed merely of buckets, carefully secured to a pole, with which they are raised, when full, from the river, and the contents poured into a duct, designed to irrigate the land.

Archimedes was the most successful of the ancients in the practical treatment of fluids; and, among other inventions, contrived a pump, fitted with a screw still known by his name, for draining water from the holds of ships, from marshes or inundated lands, in any quantity, and to any depth. A question put to him by Hiero led him to the discovery of the law of displacement. The King, who appears to have himself superintended his exchequer, gave a quantity of gold to a goldsmith, with orders to make him a crown; and on the royal ornament being produced, suspected that some of the precious metal had been purloined, and a baser material substituted, whereupon he applied to Archimedes to ascertain the fact. The problem thus presented perplexed, but, at the same time, deeply interested the philosopher. For some days he pored over it in vain, when, as he was entering a bath, he observed that his immersion caused a displacement of the water, and he instantly sprang up, seized his clothes in his hand, and ran through the streets to his study, all the way crying out, '*I have found it! I have found it!*' He had really acquired a key to the difficulty; and having made two crowns, one of pure gold, and one

of silver, he successively immersed each in water, and then submerged the crown in dispute, by this method convicting the dishonest goldsmith, as his computation from the quantities of water displaced by the respective crowns, and their relative weights, demonstrated that the suspected fabric was composed of a mixture of gold and silver, and gave the specific proportions of each.

The first settlements of man were made on the borders of the sea, of inland lakes, or of great rivers, where, as the ever-moving waters flowed past, or dashed their billows against the rocks, his eye was attracted by the varied phenomena they presented, and their different influences and conditions. Let us see man launch himself on the waves, standing on the trunk of some huge tree, which a swollen torrent has wrenched from the mountains, and which, as it floats by, strikes the shore where he dwells. Perhaps by accident, perhaps by instinct, he touches the water with his hand, and finds at once a paddle and a helm. Thus he attains to the knowledge of propulsion; and no longer fears to move from the shore: he has mastered one of the secrets of the great deep.

Or let us watch him drawn to the water by

its coolness, after the burning heat of an eastern day. First he steps cautiously into the stream, clinging, perhaps, to the turf that carpets the shore; he extends himself on the water, and finds, with mingled surprise and joy, that he floats; his hands strike out beneath, his feet catch the same impulse, and now he swims. By practical knowledge he becomes familiar with the principles of displacement and gravity without being conscious of their existence.

Attention was attracted to the sea by many circumstances, although, in their operation, they naturally influenced but comparatively few minds, the majority being repelled by the visible, and still more daunted by the unknown terrors of the waves. But while some were excited by curiosity, and others by a spirit of adventure and a love of excitement, a law of the creation irresistibly tended to promote maritime enterprise, compelling mankind to seek in distant countries articles of necessary use or consumption, providently distributed over different regions. Commerce was thus the mother of navigation; and, in ancient as in latter days, everything was braved in the pursuit of gain. Yet, for many ages, the chief action of traffic was necessarily over-

land, and was carried on by companies of merchants, each individual having his own separate venture, but all travelling together for mutual protection. The earliest authentic mention of these caravans is in the history of Joseph, B.C. 1725, 'And they sat down to eat bread, and they lifted up their eyes and looked; and, behold, a company of Ishmaelites came from Gilead with their camels bearing spicery and balm and myrrh, going to carry it down to Egypt.'[22] Camels here mentioned as the beasts of burden, were universally selected, as they still are, for these expeditions, their capacity for enduring thirst rendering them particularly suitable; and, in fact, nature has provided them with a reserve supply of water, as if to complete their equipment as ships of the desert. They are, indeed, mentioned at a much earlier date, as the animals used for transport both of men and burdens; and at one time we find Abraham and Isaac, and at another, the servant of Abraham, travelling with a camel. Long distances were often traversed on the ass, and the brethren of Joseph journeyed in this way from Canaan to Egypt. The horse, so cherished by the modern sons of the desert,

[22] Gen. xxxvii. 25.

appears to have been trained exclusively for service in war, or harnessed only in the stately chariots of Kings, on occasions of pomp and solemnity.

When man had discovered, in some such way as we have imagined, the leading principles of hydrodynamics—when he practically knew the law of floating bodies, as shown by the results of displacement, gravity, and propulsion, his conceptions of naval architecture readily expanded, and the floating tree was converted into a dug-out, such as is still made by the Indians of North America. The reeds on the banks of the Euphrates and the Nile furnished wicker boats, covered with hide or skin, which safely traversed those great rivers, and, indeed, are still the craft best suited to the Euphrates. Pliny[23] affirms that voyages of any length were originally performed on rafts, impelled by a sail; but this must have been at a very remote period, as the patriarch Job, seventeen centuries before the Christian era, speaks of 'swift ships.'[24] In another passage, he refers to 'boats of reeds,' which might apply either to those of the Nile or the Euphrates. According to Pliny, Danaüs was the first 'ancient mariner' who

[23] Lib. vii. c. 57. [24] Job ix. 26.

performed the voyage from Egypt to Greece in a ship, but the same achievement has been assigned, with more probability, to both Cecrops and Cadmus. Ships are represented on the Egyptian monuments, as well as on those of Assyria, and the date is long anterior to that fixed for their introduction by the Romans. The rigging, if fully delineated, was at that time very simple, consisting only of a central mast, securing at its summit a rope pulled tight to the bow, and another fastened to the stern. Whether these vessels were furnished with a sail is not shown, but the fact can scarcely be doubted; for though oars continued to be used on Mediterranean voyages even in modern times, the prevalence of periodic winds in the Red Sea, and on other Eastern waters, must have dictated the introduction of sails at the very outset of maritime enterprise. The invention was ascribed by the Greeks to Dædalus, the Athenian, who, according to the myth, fabricated wings of feathers and wax, by which he was enabled to fly, in company with his son Icarus, from the island of Crete, where King Minos had thrown him into prison. Icarus, soaring too high, deranged his pennons, and fell into the Icarian Sea,

which took its name from the incident, but Dædalus succeeded in reaching Sicily. From this old fable we learn that the philosopher and his son fled on two rafts, fitted with sails, and that, while the bark of Dædalus reached its destination, that of Icarus, through some accident or mismanagement, foundered on the voyage, entailing destruction on the adventurous navigator.

The oar, as originally shaped, is said to have been introduced by the Capæ, and, after a short interval, was furnished with its broad blade by the Platæans.[25] Vessels were soon constructed with two banks of oars, and the tiers were successively augmented to forty,[26] though on what principle, in reference to equilibrium and propulsion, cannot now be ascertained. Eupalamus invented the anchor, and the helm and rudder were supplied by Tiphys.[27]

Dædalus, the mechanic, mathematician, and shipwright, was also a sculptor. The versatility of those mighty sages of old corresponded with their calibre, and extended over the whole known range of science and art. Dædalus was a perfect type of the school—if school that can be called, which,

[25] Pliny, lib. vii. 57. [26] Ibid. [27] Ibid.

taught only by nature, was represented by a succession of individuals, rising in different ages and countries. They were prophets—not by inheritance, not by succeeding to a vacant mantle, but by intuition, by birth, by the ever-present inspiration, which played like a living fountain in their breasts. Dædalus, who flourished about B.C. 1288, is a distinct character. Thoth and Thales were abstruse, speculative; Dædalus is practical: they were hermits; he is a man of the world, ambitious, enterprising, bold, and unscrupulous, jealous of fame, and impatient of opposition. Keener eye or prompter will never existed. There is a sort of electricity in his hand, which realises a conception as it flashes through his mind. His study, abhorring the vacuum of seclusion, is a carpenter's shop, a mason's yard, a blazing forge. Saws and lathes are at work, mallet and chisel, cutting and turning and chipping, while the furnace throws up its sparks and smoke, and a hundred wheels revolve in the laboratory of his brain. There, in the midst of it all, he stands, half naked, a Cyclop, his huge frame throbbing with strength and muscle, his bare, brawny arms raised aloft, and wielding a mighty hammer. Nothing daunts him, and

he can be stopped by no obstacle. Woe to the man or thing that comes in his way! Poor Talus is broken to powder. Dædalus, who brooks not competition, tosses him from the ramparts like a pebble, with as little scruple and as little remorse; and the brain which was to raise and sustain a rival lies reeking on the rocks. Minos threw the great mechanic into prison, but what were bolts and bars to Dædalus? Drawn out, and changed into files, the bolts cut the bars in sunder. The sea flows before him, but it presents no barrier. A fallen tree, a couple of stray planks, to which his axe gives shape and balance, form a raft; he invents a sail, and gives it wings. He reefs and steers as if trained a sailor, while poor Icarus, overwhelmed by a squall, goes to the bottom. Chart there is none; but Dædalus is an astronomer, and in the darkest night finds a compass in the skies. In short, his invention and cunning are, in every possible emergency, equally swift, adroit, and inexhaustible.

As Dædalus represents the practical, Aristotle expresses the highest development of the theoretical genius of antiquity. His mind was more capacious, but not so initiative, not so original. He raised the lofty

tower of his wisdom on other men's foundations, on Plato, on Thales, on all the learning of the Egyptians; or, perhaps, it would be more correct to say, that he took the materials which others had accumulated, and made them a concrete platform for himself. With an appetite for knowledge that was insatiable, an ostrich-like digestion, that drew nutriment from every ingredient, and to which earth, air, fire and water, every element and every substance, were the same, he appears as a living cyclopædia, embracing all the diversities of human information, methodically arranged and indiced. Here lay at once his merit and fault, his strength and weakness. He generalised into confusion, extended his glance to such a distance, that the earth and sky, the confines of bodies, were lost in each other, and what was meant for harmony, became a chaos. Nature will not be chained or curbed or measured. She is unfathomable, as profound as she is vast, and as varied as infinite. Order reigns, and symmetry, and perfect, exquisite, unspeakable concord. But who can cram all this into a nutshell? Not even Aristotle!

But the Stagyrite fixes an epoch in human progress. His great faculties, ever travelling

upward, reached a height previously unknown, whence, as from Pisgah, he saw the land of promise spread before him—the land he had opened to mankind, but could not himself enter. Death struck him on its borders, as he pointed the way forward—forward, but there was no Joshua to lead.! and while, in practice, Aristotle taught that the road was to be traversed step by step—that the only key to knowledge was the accumulation of facts, he laid the stumbling-block of his syllogism in the way. He had an instinctive perception of induction, but his theory of classification obscured his vision; and, for a thousand years, this great intellectual light, this eye of antiquity and star of the first magnitude, darkened the whole human race.

Archimedes partook both of the theoretical and practical schools, of Aristotle and Dædalus; but he was, at the same time, special in himself, peculiar and unique. His learning had not the Stagyritan vastness, but what it wanted in breadth, it yielded in depth, in its clear, lucid, rational deductions, and its ready application. If he did not possess the versatility, the subtle logic, or the analytical cunning of Aristotle, he was no way inferior to him in grasp, and real pristine genius. His

powers were full as robust and full as elastic. In mechanics he equalled, if he did not surpass, Dædalus. He had the kindred passion for the foundry and workshop, though he loved also the quiet closet and the midnight lamp. His hand communicated a Cyclopean force, but it could likewise impart a touch of consummate delicacy and finish, smite the iron or mould the brittle glass with the same facility. Nor was there any problem, however abstruse, any undertaking, however prodigious, that he was unwilling to attempt, turning it over and over in his brain, this way and that, first subjecting it to one process and then another, and, though shut up in his own abstractions, all the while alive to any suggestion from the operations of the restless world without, till, at length, he arrived at a solution or a plan. He looked upon the universe as a sort of Sibylline scroll, in which every enigma was explained, and every mystery unravelled; and, with this spread before him, he had only to discover a specific phenomenon to elicit the instruction he desired. Thus he discerned a law, a geometrical adjustment, the action of a divine mechanism, in every natural effect, and treasured it up as a lesson of highest import, the response of an oracle. No other

philosopher but Newton ever searched nature after this fashion: no one else ever pillowed on her breast, and coaxed her out of her secrets, with so much success. From such lovers she could withhold nothing. They, in fact, put her in the confessional; and by persuasion, by cross-questions, by artful surprises, drew her into disclosures which had never been dreamt of. She could not drop an apple to the ground, but Newton would trace the effect to some undiscovered cause; she spilled a little water, and Archimedes, floundering in his bath, detected the law of displacement. Snatching up his toga, but without pausing to throw it over his dripping frame, he rushes into the street, crying aloud, 'I have found it! I have found it!' His shouts, the strange spectacle of his naked figure, and wild antics, draw the wondering citizens to their doors, crowd the streets, and gather a mob at his heels; but he sees nothing, knows nothing, of the rabble rout, and runs on far ahead, still uttering the same cry of triumph. What has he found? A pearl of great price? a buried treasure? Nothing of the sort! And as the incident is explained, and the facts transpire, there is many an insensate grin, and significant

tapping of empty foreheads, while a few more humane turn away with sorrowful looks, equally convinced that Archimedes is mad.

This beacon of ancient time resembled Newton in other particulars, in personal traits, in idiosyncracy. Like our English prophet, he had a supreme contempt for sensual things, for the pleasures of the table, and the indulgence of mere animal propensities and appetites. His existence was essentially spiritual, and his tenement of clay was knit to him, without being part of him, as the shell of a mollusc affords it a habitation, though the one being hard, dry, and dead, and the other all pulse, they have no sympathy in common. Newton forgot his meals: Archimedes was dragged to them by force. Nothing could tear him from his favourite problems. What was a banquet of viands and wines, compared with this feast of reason and flow of soul! 'Follow me to Marcellus!' cried the Roman soldier, bursting into his study. Archimedes, present in body, but far, far away in spirit, had forgotten the very name of Marcellus, forgotten the siege, heard nothing of the din and tumult and battle-roar of the assault, which, pouring

through the imminent deadly breach, had brought Syracuse under the Roman yoke. 'Wait till I have finished my problem,' he replies, though the sword flashes in his face; and, still persisting in delay, he yields his life rather than stir.[28]

The period of the alleged invention of sails by Dædalus would just allow of their being used by Jason, in the famous ship Argo, the Ark of Greek mythology. The Argonautic expedition, if not altogether fabulous, occurred about B.C. 1263, or 69 years before the capture of Troy;[29] and as the sons of Dædalus are mentioned by Homer as serving in the Trojan war,[30] the two dates seem reasonably proximate. But though fitted with a mast and sail the Argo was not dependent wholly on the winds, being propelled by fifty oars, which, in the calmest sea, kept her steadily on her way. Her voyage from the Pegasæan Gulf to Colchis, in the Caucasus, opens the page of ancient geography; and in order to fully comprehend the successive advances of seamanship and naval architecture, this science must be viewed at its source; for it constitutes, in conjunction with astronomy, the very groundwork of navigation. Nor is it

[28] Plutarch. [29] Pl. vii. 56. [30] Iliad.

possible to conceive a branch of knowledge more likely to engage the fathers of philosophy, or more calculated to attract and interest society at large. Geography places before us, in a succinct form, all that can be told of the inhabitants, the productions, the varied climates, and the physical aspect of the earth. It interests us by a relation of which we are ourselves the subject, the object, and the aim. It thus appeals to every understanding, and, while giving the history and description of our species, reveals the true structure, the configuration, the character and extent of the globe.

During the infancy of mankind, the world was believed to be an immense expanse, or disc, of which each nation considered itself the centre. The regions not yet explored were appropriated to various fabulous races, to men with one eye, or beings combining the figure of a man with the head or the extremities of a beast, or to Anthropophagi or Hermaphrodites; the ocean was supposed to be studded with islands, inhabited by giants or pigmies; and round the whole was a chaotic gulf, which separated the world from space. Even after the Augustan age of Rome, when a great part of the world was

actually united under one government, all these absurdities are gravely brought forward by Pliny, with a credulity perfectly immovable. At first sight, such a result may appear the more surprising, as the Phœnicians, with the indomitable spirit of a maritime people, had penetrated to distant localities upwards of fifteen centuries before; but, in truth, the marvel is not so great as it appears. Not only were the travellers of antiquity infected with the proverbial sin of their class, in a propensity to magnify the dangers and undoubted difficulties they had encountered; but the dissemination of such reports was a traditional policy with the Phœnicians, who wished to deter the merchants and navigators of other countries from following in their track. By this means they preserved to themselves all the advantages of the commerce they had opened, and, at the same time, acquired a character for intrepidity and enterprise, which excites the admiration even of the present day.

It is a fact worthy of note that none of the cosmographical fallacies of the ancients are found in the writings of Moses, from whom we derive our first lessons in geographical knowledge. The information he affords on

the subject, being only incidental, is necessarily scant, but, in its bearings, it is of great value, as showing that so far back as B.C. 1720 a widely-extended commercial intercourse existed among Eastern nations. At that distant period, caravans travelled to Egypt from Midian, a territory on the northern extremity of the Persian Gulf, and shaped their route through Palestine and the desert. What more reasonable than to suppose, that the Persian Gulf itself, washing the coast of this enterprising people, had also been traversed, and that the Midianite caravans conveyed to Egypt the costly produce of India? A few centuries later, India is distinctly referred to by Job, and allusion is even made to Ceylon. Yet the geographical knowledge of the Hebrews did not expand in a corresponding degree. About five centuries before the Christian era their circuit of travel appears to have been bounded to the north by Mount Caucasus, and to the south by the entrance to the Red Sea, comprehending in its sweep the territories of Persia, Armenia, Assyria, Arabia, and Asia Minor, with the 'land of Egypt,' and Ethiopia. Nor can we be surprised at the geographical ignorance of a comparatively isolated people, when, at the same

era, the polished and enterprising Greeks appear in this respect to as little advantage. In the schools of Athens and Corinth, Delphi was regarded as the centre of the earth, and the habitable world was confined to the narrow limits of Greece, the Archipelago, the western lands of Asia, the shores of Egypt and Libya, Sicily, and the south of Italy. The fair and fertile regions beyond were given over to supernatural beings, monsters, genii, and enchantment. Yet upwards of five centuries before, the Phœnicians had traversed the Mediterranean, passed through the Straits of Gibraltar, penetrated to the British islands, and established a traffic in tin with the inhabitants of Cornwall. The mariners of Solomon and Hiram brought gold from Ophir, supposed to be situated on the western shores of Africa, or the east of India; and it is certain that silk and other Indian products had found their way to Jerusalem at this time. Carthage, a colony of the Phœnicians, sent forth Hanno on a voyage of discovery, B.C. 490, and this Columbus of antiquity proceeded round the coast of Africa as far as the river Senegal, visited the Canaries and Gambia, and before his return, steered northward to Britain, thus circumnavigating Spain,

and coasting a portion of France. But if we may credit a story in Herodotus, the palm of maritime success still appertained to the Phœnicians, who had anticipated and even greatly surpassed the achievement of Hanno, two hundred years before, B.C. 690. The narrative affirms, that Necho, King of Egypt, on completing his great canal to the Red Sea, despatched several vessels in charge of Phœnician mariners, by this great highway, with orders to return to Egypt through the Pillars of Hercules and the Mediterranean. This extraordinary task they accomplished in three years, circumnavigating the whole of Africa, and entering the Nile from the Levant. There is but one circumstance of the alleged voyage that Herodotus doubts,[31] which is the assertion of the mariners that, during their circuit of the great African continent the sun had, for a certain distance, risen on their right; but this phenomenon is perfectly comprehensible in modern times, and is the best testimony that could be adduced to the reality of the voyage.

Herodotus himself was a great traveller, and in the account of what he personally observed and the particulars he was able to

[31] Herod. iv. 41.

collect from others, has given us so much information respecting contemporary nations, their resources, territory, and social habits, that 'the father of history' may almost be designated the founder of geography. He was the first to make the discovery that the earth was not a circular plane; and though he retained the populations with ne eye and other physical defects, he greatly enlarged the boundaries of the habitable world. Starting from Halicarnassus, his native city, on the borders of Asia, he carried his explorations along the Black Sea to the Danube, which he ascended almost to its source, amidst the impenetrable forests of central Europe. At this extreme point, surrounded by savages such as could not now be found in the wilds of New Zealand, the intrepid traveller, unable to penetrate further, was obliged to content himself with inquiry, and brought back from the lairs of barbarism an interesting account of Western Tartary, Poland, and the hordes of European Russia. The country between the Borysthenes and Hypanis, then the hunting ground of nomade tribes, whose ruthless hands were against every man, he traversed unattended; and rising alike over difficulty and danger, carefully explored the Sea of Azoff.

Asia opened to him a still wider field. After ascertaining the situation and dimensions of the Caspian Sea, he repaired to Babylon, and then proceeded to Susa, the magnificent capital of ancient Persia, and the very site of which would now but for him baffle conjecture. Nor did he confine his researches to the vast limits of the Persian empire; but, when arrested at its boundary, pushed his inquiries into the regions on the Indus as far as Cashmere, obtained information respecting Arabia, and, on the banks of the rushing Araxis, caught a glimpse of the Massagetæ. He visited Egypt, traced the northern coast of Africa to Carthage, and from the facts he relates, particularly in reference to a great river, supposed to be the Niger, appears to have gone far into the interior of Africa. In this journey he met with the negro caravans, from which he obtained intelligence of tribes still more remote; and, finally, he visited Greece and her nascent colonies, terminating his travels and his life in the south of Italy.

The explorations of the famous historian were subsequently retraced and corroborated by Hippocrates of Cos, who was equally renowned as a traveller and physician. At some points, Hippocrates even extended the

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circle of geographical knowledge, and from all collected a variety of important facts, concerning the physical condition, the climate, and the general features of the region. On this account he may be considered the originator of physical, as Herodotus was of terrestrial geography; and his researches gave a new impulse to science and civilization.

But with all its obligations to Herodotus and Hippocrates, geography owes its embodiment to the master genius of Aristotle. It was his mighty hand that grasped its scattered elements, moulded them into shape, and deduced from the collected facts the spherical form of the earth; thus placing our planet in its proper rank among the orbs of the universe.

The expedition of Alexander into Asia, B.C. 327, opened to Aristotle a brilliant opportunity of extending the conquests of science; and, at his suggestion, the King surrounded himself with a staff of philosophers, who, as the army advanced, were kept as busy as his generals. The limits of geographical knowledge were now greatly enlarged, and, by observation or report, were brought to include nearly the whole of Asia. Traversing vast marshes, deserts, and steppes, crossing mountains and interminable plains,

the Macedonian host successively reached the four great streams of the Euphrates, the Indus, the Oxus, and the Jaxartes, while the snow-capped Himalayas, to which they gave the name of the Indian Caucasus, rose, on their flank or in their front, to a height of 20,000 feet.[32] Alexander finally halted his army in the Punjaub, or land of the five rivers; but he himself descended the Indus to the ocean. Every step of this long march gave some acquisition to the philosophers, in botany, zoology, cosmogony, terrestrial and physical geography; and each fact being noted, was eventually embodied by Aristotle, or, in accordance with his rules, in a system of instruction that embraced the whole economy of nature.

Eratosthenes of Cyrene, the librarian of Alexandria, ascertained the earth's circumference,[33] about B.C. 210, and drew a map of the world, which formed the basis of a map by Hipparchus, B.C. 140; but the latter introduced the important addition of latitude and longitude, which he was the first to determine.[34] Strabo, who flourished in the reigns of Augustus and Tiberius, A.D. 1—25,

[32] Strabo xv. Diod. Sic. xvii. 82. [33] Ci. At. ii.
[34] Plin. ii.

completed the circle of geographical science, as taught in the schools of antiquity. Emulating the intrepidity of Herodotus, and the patient research of Hippocrates, Strabo visited and diligently explored most of the countries he describes, devoting nearly the whole of his life to this arduous and perilous enterprise. His celebrated *Geography* is thus one of the most valuable legacies of ancient learning. It consists of seventeen books, commencing, in the first and second, with a preliminary dissertation, followed successively by a description of Spain, Gaul, the British Isles, Italy, Germany, the Danubian and Euxine countries, Greece, and the Archipelago. Four books, beginning with the eleventh, describe Asia within the Taurus, and the fifteenth and sixteenth take the outer countries of the East, including Syria, Persia, Arabia, and India. The work concludes with an account of Africa, as far as it was then known, and most of which is founded on personal exploration, or inquiries on the spot. It is written in Greek, and is remarkable for the purity and elegance of the composition, and the universal information displayed by the author. Trained by Xenarchus, the Peripatetic, deeply versed in the varied erudition of the Athenian schools, Strabo was competent

to treat equally of the past and the present; and his geographical descriptions are introduced by an accurate history of the particular country under view, while, at the same time, they are enriched by observations on the phenomena of nature, as exhibited in different climates and regions, extending to the determination of the maximum of atmospheric heat under the tropics and the equator, the comparison of the longer or shorter passages of the sun across the zenith, the various influences which produce changes in the earth's surface, the Archimidean doctrine of the general level of the sea, the origin and character of seas, rivers, and currents, the operation of volcanoes and earthquakes on the earth's crust, and the nature of petrifactions and marine impressions. The religion and manners, the social habits, the institutions, superstitions, and traditional customs of each tribe or people are separately delineated; and, by marking their diversity of physique, an attempt is made to indicate the primary types of race. The author's profound research is evinced by a prophetic hypothesis, based on a supposed prolongation of the Tauric chain, that between the eastern shores of Asia and the west of Europe; 'near the parallel of Athens, which

traverses the Atlantic Ocean, there may be, in addition to the world we inhabit, one or more other worlds inhabited by races different from ourselves.'[35] Here we have the first conjecture of a western continent.

The petrified fish and shells observed by Strabo in different parts of the earth had not escaped the notice of earlier travellers; and, from a very remote period, they were recognised as indubitable evidence of great terrestrial convulsions. So far back as B.C. 880, we trace the faint outline of a geological theory in the Ordinances of Menu, the great teacher of the Hindoos. Menu, after stating that the past has been a succession of periods, each comprising an infinite number of ages, affirms that 'there are creations also and destructions of worlds innumerable.'[36] Herodotus records the opinion of the Egyptian priests that their native country, as far as the mountains beyond Memphis, was originally a bay of the sea;[37] and adds from his own observation, 'I myself give credit to these things concerning Egypt, and am myself convinced of their truth, when I see that Egypt projects beyond

[35] Lib. i. and ii.

[36] Sir W. Jones's 'Institutes of Hindoo Law, or, the Ordinances of Menu.'

[37] Herod. ii. 10.

the adjacent land; that shells are found on the mountains; that a saline humour forms on the surface even to corrode the pyramids; and that this mountain which is above Memphis is the only one in Egypt that abounds in sand.'[38] Such a passage claims to be quoted, as it shows how closely the configuration and constituent structure of the earth were now observed, B.C. 455. Plato[39] has preserved to us the Egyptian myth, taught by the priests, that the world was subject to periodic deluges and conflagrations, entailed upon it by the wickedness of its inhabitants; and, according to Cassander, these visitations occurred at the conclusion of a great cycle of 360,000 years, when the sun, moon, and planets simultaneously completed their revolutions in the same sign of the zodiac. The world was said to be reproduced from an egg, by a spiritual Being, uniting both sexes; and, as the same process is adopted by Menu, the myth may possibly veil some tradition of Noah and the Deluge, so obscured by time as to be unintelligible.

Pythagoras, who visited both Egypt and India, caught the speculative, while he repudiated the fabulous tenets of primeval

[38] Lib. ii. 12. [39] Pl. Ti.

geology. His structural theory of the earth is coloured by his doctrine of the transmigration of souls, which may, in the first place, have been deduced, either by himself or his Hindoo teachers, from the phenomena exhibited by the operations of nature. He taught[40] that matter was imperishable, though, by an immutable universal law, it was ever in motion, ever changing, taking some new form, posture, quality, or condition. Transmutation was effected by particles, while the mass appeared to be always the same. Thus the sea, as was proved by shells and other marine remains found in elevated plains and on the summits of mountains, was converted into dry land, and, on the other hand, land sank beneath the waves; swamps were drained by streams, which, in their course, wore away hills and excavated valleys, depositing the drift in the bed of the sea, where it formed peninsulas or islands. Other changes were accomplished by volcanoes and earthquakes, which absorbed lakes, upheaved mountains, and opened thermal springs, endued with different mineral and medicinal qualities. All these facts are based on observed phenomena; they were more firmly established

[40] Ovid's 'Met.' xv.

by the investigations of Aristotle;[41] and, recovered from the gulf of the dark ages, they now form the basis of modern geology.

Strabo has embodied in his *Geography* most of the geological principles of Pythagoras, as facts confirmed by personal observation; but his celebrated work, though composed at the beginning of the Christian era, was but little read by the ancients. Even a century later, geographical science was chiefly known from the work of Ptolemy Claudius, who flourished in the reigns of Adrian and Antoninus Pius A.D. 120—160; and this continued to hold the highest place for many ages. It occupies in geography the same relation to the more elaborate writings of Strabo, that, in modern times, those of Linnæus present in natural history to the researches of Buffon; and, while naked in description, astonishes us by its methodical classification, its apt nomenclature, its accuracy, expansion, and grasp. Still it was more an itinerary than a geography, a massive and compact scaffolding rather than the edifice itself; and its geographical notices are like the inscriptions on an ancient monument, giving a history in an epigram. Though void

[41] Meteorics, c. 12.

of physical details, the work embraces a vivid outline of the world as it was then known, extending from China to Britain, and from the Indian Sea to the west of Africa, while the illustrative maps determine the relative position of different places, according to their parallels of longitude and latitude and the length of the day. By prosecuting inquiries among the Oriental visitors to Alexandria, in the numerous caravans from central Asia, the author was able to trace the configuration of the Caspian Sea, the insulation of which had been conjectured by Herodotus, and established by Strabo; but, misled by travellers, he attributed to the Indian Sea a similar character, representing it as enclosed between Eastern Africa and China.[42] Even with such defect, however, his *Geography* and atlas are an invaluable testimony to the progress made in terrestrial knowledge, and decidedly mark an epoch in the history of the human mind.

Ptolemy Claudius was a native of Alexandria, and obtained the advantage of training in the renowned schools of that city, founded by the illustrious dynasty of which, though no way connected by descent, he bore the name.

[42] Ptolem. iv. 9; vii. 3, 5.

The regal family originated with Ptolemy Lagus, son of Arsinoe, the mistress of Philip of Macedon, but afterwards married to Lagus, who gave a patronymic to her offspring.

Ptolemy learnt the art of war under Alexander, and when the Marshals of the great hero, prefiguring the experience of modern times, exchanged their helmets for royal crowns, he obtained the government of Egypt, Libya, and part of Arabia. He did not actually assume the title of King for nearly twenty years, by which time his clemency, benevolence, and noble qualities had gained the affections of the people, B.C. 303. It was now that he received the name of Soter, his most general appellation; and which was bestowed by the inhabitants of Rhodes, to commemorate his achievements against their common enemies. At the court of Macedon, he had been constantly in the society of philosophers—perhaps had shared with Alexander the instructions of Aristotle; and it was natural that such companionship should infuse into his mind a love of knowledge, which his travels in the East had sustained and strengthened. Whatever tended to the advancement of science and the arts, the elevation of the human intellect, or

the extension of civilization, was sure to receive from him the most liberal encouragement; and his palace afforded a home to the learned of all countries, equally with those of his own dominions. Justly deeming commerce the missionary of civilization, he increased the facilities of nautical intercourse, by every means in his power; and, among other measures, secured easy access to Alexandria, by erecting, on a small island in the bay, a tower of white marble, called the Pharos, the summit of which was illuminated at night by large fires, visible, it is said, at a distance of a hundred miles. This stupendous edifice was esteemed one of the seven wonders of the world; but Ptolemy laid the foundation of a greater wonder, and a more glorious light-house, in the Alexandrian library, which he stored with all the learning of antiquity, and which, under the rule of his successors, accumulated the incredible number of 700,000 volumes. He also established a learned society, under the now familiar name of *Museum*, to the members of which he paid a regular stipend, conditional on their employing themselves in philosophical pursuits; and, leaving no field unexplored, he despatched scientific expeditions into Asia and Ethiopia,

with instructions to report on their physical and terrestrial characteristics, and examine every subject of curiosity and interest. Ptolemy was the author of a history of Alexander the Great, which is unfortunately lost; but, if we may credit the testimony of his contemporaries, it was a composition worthy of his fame and genius.

The crown of this great King fell to his second son, bearing the same name, with the addition of Philadelphus, an ironical allusion to his conduct to his two brothers, whom he put to death for rebellion. But, though stained with fraternal blood, Ptolemy Philadelphus emulated the career of his father, and, throughout his reign, was a generous benefactor of literature, science, and the arts. He was the friend, while he was at the same time the pupil of Euclid, of Theocritus, Callimachus, and Lycophron, and these philosophers lived in his palace, and ate at his table. Ptolemy was also a kind protector of the Jews, whom his father had brought captive into Egypt, and, eager for knowledge in every shape, he appointed seventy of their Rabbis to render the Hebrew Scriptures into Greek, whence we are said to derive the *Septuagint*, so called from the number of the translators.

The work, as an early version of Holy Writ, has proved a lasting monument to his memory, surviving the whole Alexandrian library, and was a more valuable legacy to mankind than all his treasures, which at his death, B.C. 246, amounted to 750,000 Egyptian talents, or about two hundred millions sterling.

The third Ptolemy followed in the steps of his predecessors, and was a munificent patron of learned men and promoter of philosophical research. His designation of Evergetes, by which he is best known, was given by his subjects, in acknowledgment of the zeal he had displayed, in his Asiatic wars, for the gods of his country, having recovered from the Persians 2,500 idolatrous images which had been carried off by Cambyses. He greatly enlarged the Alexandrian library, adding, among other works, translations of Æschylus, Euripides, and Sophocles, for which he procured from the Athenians the original manuscripts, depositing fifteen talents as a guarantee for their return. Evergetes died, B.C. 221, and was the last of the Lagidian monarchs who possessed the affections of his subjects, though the love of literature, transmitted with the crown from father to son,

continued hereditary in the Ptolemies, and only expired with Cleopatra, who closed the long catalogue of Egypt's sovereigns.

The ingenuity which enabled man to cross the sea, and to make a highway of great arterial rivers, speedily led him, by an analogous train of ideas, to consider the possibility of extending this mode of transit, in localities not traversed by navigable streams. Hence arose the conception of canals, claiming an antiquity prior to the historic era, which found them existing in connexion with the Euphrates and the Nile, as from time immemorial.

It has been already stated that the best authorities attribute the construction of the most ancient Egyptian canals to Thoth. The drains necessary for the reclamation of the soil after the periodic inundations of the Nile, and the sluices used for the purposes of irrigation, were themselves a miniature scheme of canals, and doubtless presented the embryo of those great undertakings. But, though full of wonder at their magnitude, the classic historians tell us little of the origin, and nothing positive respecting the dimensions, course, or mechanical structure of the Egyptian canals. Some even deny the very existence of the greatest of these artificial streams, connecting

the Nile with the Red Sea. Herodotus, however, distinctly affirms[43] that such a work had been constructed, and traces its course from the Nile, above the city of Bubasto, round the spur of a spreading mountain, southward to the Gulf. He ascribes its commencement to Necos, son of Psammeticus, B.C. 616, but asserts that it was not finished till the reign of Darius Hystaspes, about ninety years later—not a long time, if we allow for the imperfect mechanical appliances of those days, for the execution of so vast a project. The dimensions of the channel may be inferred from the fact that the navigation extended over four days, and that the stream could be traversed by four ships abreast. Strabo, a great authority, authenticates this report;[44] but it is contradicted by Aristotle,[45] who says, indeed, that such a canal had been projected by an ancient King; but that, from the difficulties in the way, it had been abandoned; and his account is borne out by Pliny,[46] who declares the work was not completed, because the Red Sea was found to be a higher level than the Nile.

The great canal of Alexandria is not so easily ignored, as its channel, now clogged

[43] Lib. ii.
[44] Lib. i. and xvii.
[45] Met. lib. i. c. 14.
[46] Lib. xxvi. c. 29.

with sand, or strewn with ruins, can still be traced. Strabo describes it as flowing from the Canopic arm of the Nile, about twenty miles from the city of Chedia; and so late as the time of the Greek empire, it afforded western nations an avenue to the East.

Another large canal was formed in the ancient bed of the Nile, which, choked towards the north by sand-drifts from the westward, is thought to have diverted itself through the eastern valley into its present channel, leaving behind a large deposit of water. This, we are told, became the root, so to speak, of the canal of Jussef, which is believed to have been constructed by King Nilus, from whom the river itself, previously called Egyptus, takes its world-renowned name, perpetuating the memory of his great improvements.

The Babylonians were scarcely inferior to the Egyptians in their hydraulic undertakings. As an example of what they achieved, it is only necessary to mention their operations on the Euphrates, which Queen Nitocris, when strengthening the defences of Babylon, diverted from its bed, draining the waters into a vast artificial basin, while massive walls were raised on the river face of the city, before perfectly

open; and access on this side rendered impossible.[47] The dams were then removed, and the water returned to the original channel. Nitocris, to give completeness to her work, afterwards threw a drawbridge over the Euphrates, connecting the whole city, which the river intersected; and, still animated by the spirit of improvement, enclosed the rushing stream for some distance between high embankments, preserving the immense plain around from inundation, when, on the approach of summer, the melting snows of Armenia raised the level of the water. The canals of the Romans were inferior in magnitude to those of Egypt and Assyria, but will bear comparison with those of modern times.

As men became more familiar with the laws of fluids, they necessarily acquired more correct ideas in the different branches of navigation. It was soon discovered that ships, whatever their dimensions, invariably have their centres of gravity a little under the centre of their lengths, and practical knowledge gradually regulated the proportions of the masts and sails, as well as the height of the hull, and the extent of displacement. A standard once fixed, it was arbitrarily and even obsti-

[47] Herodotus, lib. I., 185.

nately maintained, so that no art has advanced so slowly as that of ship-building; and it was reserved for our own age to show the scientific perfection of which it is capable.

But in the presence of those wonders of the deep—our floating fabrics of wood and iron, winged by canvas, or invisibly propelled by the screw—we must not forget the doubts, the misgivings, the great and almost insuperable difficulties of ancient navigation. Conceive the rude bark of primitive times, clumsy and cumbrous in form, unwieldy in movement, untried in capacity, starting on its errand of traffic or discovery, over a sea of indefinite extent. Without chart and without compass, with no guide but the sun by day and the north star by night, it can only creep slowly along unknown shores, exposed to all the dangers of sunken rocks and more treacherous shoals. At a much later period, when seamanship had made considerable progress, St. Paul vividly paints the manifold terrors of a voyage, even in the familiar limits of the Mediterranean.[48] How greatly must these have been aggravated in earlier ages, when the aids then possessed were unthought

[48] Acts xxvii.

of, and the Mediterranean itself was an unknown sea!

Charts were first made by the Phœnicians, who, however, hoarded them with the most jealous care, as the clues to their distant settlements. It was not till about 430 B.C. that one of these cherished productions fell into the hands of the Greeks; and they, with the assistance it afforded, in conjunction with an astronomical sphere, were then able to prosecute a voyage of discovery. The sphere, described at pp. 65, 66, ante, was invented by a Milesian—Anaximander, the companion of Thales; and to him we are indebted also for the first geographical maps, as well as an approach to the natural figure of the earth. But, like most ancient philosophers, Anaximander owed his conclusions more to his natural sagacity than to observation, though both his terrestrial and astronomical knowledge, amidst various radical errors, included some shrewd conjectures, and he taught the great truths that the moon received her light from the sun, and that the earth moved.

The mariners' compass was unknown to ancient navigators. Thales, in his endless investigations, ascertained that the magnet

possessed the property of attracting iron,[49] and some of its marvellous endowments appear to have been known to the Chinese as early as 500 B.C. Pliny also speaks of certain alleged properties of the mineral in his usual credulous strain; but he makes no allusion to its inherent quality of taking a specific direction, when placed independently on a pivot—the faculty that, in modern times, renders it an infallible pilot on sea or land, wherever ship or man can penetrate. Even on the discovery of the precious secret, scarcely five centuries ago, some time elapsed before the invention of the compass; and Columbus was the first to ascertain the real nature of its characteristics.

The helm, as it were, of primitive navigation was astronomy: its compass was the polar star, the magnet of the skies. And here we may appropriately consider what was the progress of the ancients in the celestial science, by which successive ages, through their combined observation and research, have arrived at such miraculous results.

Astronomy is the theory and history of the visible heavens. Its object is explained by its name, which, in the original Greek, sig-

[49] Bossut. 'Hist. de Math.' i. 252.

nifies *a law* and *a star*; and, in fact, the science reveals the laws of the celestial bodies, whatever their form, traces their orbits, periods, and motions, and accounts for their various phenomena.

It is impossible to say what fragments of this science escaped the wreck of the Deluge; but there is, as heretofore observed, a well-grounded traditional belief that the twelve signs of the zodiac were marked out on the sky by antediluvian astronomers. The astronomical allusions of Moses are slender and vague, such as might be expected from a religious teacher, who sought merely to show that the heavens, like the earth, were the work of God; and they afford us only the conclusion that, in the time of Moses, the moon, as well as the sun, was regarded as a luminary. But we are not to consider this fact as militating against the divine inspiration of the Pentateuch. The impression that the moon is a luminous body naturally arises from its appearance, contemplated by the eye of infant philosophy; it was a dogma of the sages of Egypt, whose system of learning Moses had imbibed; and it was the universal conviction of mankind. The Almighty has ever adapted his revelations to the capacity of his crea-

tures; and as the Hebrews, accustomed to the beautiful moonlight of Egypt, usually so clear and radiant that the night is but a kind of softened or shaded day, would, with their ordinary hardness of belief, have scoffed at the assertion that the moon was an opaque body, similar to the earth, Moses was permitted to describe it as a LESSER light—a light diminished, or, as it would now be expressed, reflected and borrowed. But it is remarkable that, with this exception—so easily and satisfactorily explained—the history of the Creation embodies no statement which can be connected with the prevailing fallacies of the time. There is no allusion to the supposed immobility of the earth, and diurnal revolution of the sun, though the phenomena of day and night are mentioned and described. In short, this sublime description of the whole physiology of nature presents no difficulty irreconcileable with modern science.

The first astronomer of whom we have any account is Abraham, who, according to Josephus,[50] derived his belief in a Supreme Being from 'the phenomena that were visible both by land and sea, as well as those that happen to the sun and moon, and all the

[50] 'Antiq. of the Jews,' i. vii.

heavenly bodies.' Josephus considers that he is alluded to by Berosus in the following passage: 'In the tenth generation after the Flood there was among the Chaldeans a man righteous and great, and skilful in the celestial sciences.' Chaldea was the native country of Abraham, and, as regards our later world, the cradle of astronomy. In its soft transparent skies, the bright orbs of heaven shone with peculiar brilliancy; and a people habitually contemplative were naturally attracted by the spectacle. After regarding them as the emblems of the Deity, and then adoring them as deities themselves, the meditative sage was led to observe their phenomena, to compare their movements, and to trace their course. The meteors that darted across the sky astonished and bewildered him; now he regarded them as messengers of the gods, now as mysterious omens of coming events. A deeper interest was excited by comets, appearing suddenly in the heavens, and threatening a conflagration of the universe. With horror he watched their progress towards the sun, expecting the dread moment when nature would be destroyed. Other phenomena, arising from the aspects of the heavens, were not less startling, and not less unaccountable. In

the midst of profound repose, when the atmosphere was calm, and everything betokened security, the sun was obscured by an eclipse, and the whole world enveloped in darkness. What prodigies to behold! what mysteries to investigate and explore!

The mind, thus aroused and interested, shook off the chains which credulity and superstition had forged, and began to scrutinise these mighty secrets. Was it forbidden to engage in such speculations, seizing, as they did, at once on the imagination and the reason? At the door of the great temple of knowledge, human intelligence paused, doubting and dismayed; then crossed the awful threshold, and looked around.

Carefully and accurately the Chaldean philosophers registered the result of their observations, which carry us back more than 4,000 years, or nineteen centuries before the invasion of Alexander the Great, by whose command they were collected. Time paved the way for a calculation, by which it became apparent that an interval of 223 lunations, or 6585 days 8 hours, sufficed to bring back the moon to the same relative position to the sun and her own node and perigee; and the record of the eclipses observed during one period

guided the skilled astronomer to those which would occur in the next. Who was the author of this sublime discovery, history has not revealed; but, even after the lapse of ages, imagination may faintly conceive, from our own impressions, how great must have been his triumph. From this moment, the scales fell from the eye of human reason. One of the prodigies that had appalled mankind was stripped of its terrors, and appeared as the beautiful result of a natural cause. Every phenomenon, however it diverged from the ordinary course, might now be ascribed to a physical law; the philosopher took confidence in the permanence of nature, and its harmony and stability were restored.

An eclipse of the moon was registered by the Chaldeans upwards of seven centuries before the Christian era; but this, though the earliest on record, is not to be regarded as the first observed. At that time the Chaldeans had made considerable progress in astronomy, and accurately noted every phenomenon, insomuch that, in the reign of Hezekiah, we find them sending a scientific mission to Jerusalem, to make inquiries 'of the wonder that was done in the land,'[51] and which another

[51] 2 Chron. xxvii. 31.

passage[52] of the Sacred Volume explicitly describes:—'And Isaiah the prophet cried unto the Lord, and he brought the shadow ten degrees backward, by which it had gone down in the dial of Ahaz.'

The occultation of the stars cleared away the mystery which enveloped, like a cloud, the eclipses of the sun, and they were now ascribed to the temporary interposition of the moon. Planets were distinguished from the fixed stars by their march round their orbits, all included, with that of the moon, in an imaginary zone, enclosing the grander track of the sun, and which received the appellation of the zodiac. This vast belt was parcelled into twelve constellations, named from some ideal resemblance to the forms of certain animals, or to characteristics of the particular period of the sun's passage through their limits, and the twelve signs, extending over the whole of the sun's path, comprehended the four annual seasons. The progress of the great luminary was indicated by the disappearance of the principal stars, blinded by his light; and his complete revolution marked the closing year.

Thus did nature establish her everlasting calendar. Man, her pupil and offspring,

[52] 2 Kings xx. 11.

conned the lesson, and eagerly pursued his researches. The eclipses and varying phases of the moon were accurately observed: the rising and setting of the chief stars, as well as their occultation by the queenly satellite, diligently recorded; their orbits discovered and delineated; and their progress ascertained by their advance on the fixed stars intersecting their track. Diodorus Siculus affirms that the periods of the five visible planets were all known to the Chaldeans, and, referring to their lunar records, says—what indeed evinces the closeness of their observations—that they considered the moon to be the smallest of the celestial bodies, and the nearest to the earth. They also ascribed a spherical form to our planet, which was at the time regarded generally as a circular plane.

The Egyptians were as skilled as the Chaldeans in the problems of the heavens. From the summit of a towering pyramid, in the silence of midnight, with the sleeping land around, and a mountain of dead below, the philosopher of Egypt raised his eyes in awe to the sublime dome that roofed the world. The clear sky of that favoured clime aided his observation, and fully revealed glories seen but seldom in other regions. The majesty of nature, elsewhere dimmed by clouds, was here unveiled

and naked. To the eye of the adoring observer, its aspect was pregnant with mystery, destiny, and eternity.

Following the example of the Chaldeans, the Egyptians claimed to have preserved a registry of solar and lunar eclipses for a fabulous period, extending back for 50,000 years from the present time; but a slight examination, based on modern calculation, proves the fallacy and absurdity of their pretensions. They, indeed, asserted, if we may credit Herodotus, that their early astronomers had noted two occasions when the sun rose in the west instead of the east, an incident which, it is needless to add, would have destroyed the whole system of the Creation. According to Diogenes Laertius, they were acquainted with the spherical form of the earth, and conjectured that the interposition of its shadow caused the eclipse of the moon. Eclipses of the sun they calculated by a cycle, which they probably derived from the Chaldeans, and, in their turn, imparted, with their other astronomical knowledge, to the Greeks, through the medium of Thales.

Much of the astronomical lore of Chaldea was known to the Arabs. Job, who resided in Arabia Felix, and whose vast flocks suffered

so severely from Chaldean forays, exhibits an acquaintance with the twelve signs of the zodiac, referring, in his oration to his friends, to the boundless power of the Almighty, 'which maketh Arcturus, Orion, and Pleiades, and the chambers of the south.'[53] On a subsequent occasion, Job's complaints are met by a representation of the littleness and ignorance of man, in which he is asked if he can 'bind the sweet influences of Pleiades, or loose the bands of Orion. Canst thou bring forth Mazzaroth in his season, or canst thou bind Arcturus with his sons?'[54] From a passage in Amos, it would appear that the constellations were familiar to the Hebrews, as they were, in all probability, to most of the Eastern nations. 'The prophet exclaims, 'Seek Him that maketh the seven stars and Orion.'[55] There can be little doubt that the zodiac and its signs were very early known to the Persians. Their astronomical books, recording the observations of their Magi, ascend to a remote period; and they mention that the four cardinal points of the sphere were once indicated by four radiant stars, a phenomenon which has been thought to point at a remarkable distribution of the constellations, when

[53] Job ix. 9. [54] Job xxxviii. 31, 32. [55] Amos v. 8.

Regulus and the Southern Fish stood in the two solstices, and Antares and Aldebaran occupied the two equinoctial points. According to a modern calculation, however, this configuration must have happened about thirty centuries before the Christian era, or a thousand years prior to the Flood, so that, if the entry in the Persian books is to be regarded as genuine, it must have been derived, as an observation of the early world, from Noah or his sons. But such a conclusion is inconsistent with the degree of astronomical knowledge attained by the Persians, which, at a comparatively late period, was very limited, since they maintained that the earth was a greater distance from the moon than from the stars.

The Chinese, scarcely less boastful than the Persians, claim to have been acquainted with the constellations as early as B.C. 2756, when their Emperor Foki is alleged to have drawn figures of the heavenly bodies, and to have computed astronomical tables. Another Emperor is awarded the high merit of having observed a singular conjunction of the five planets, which is believed to have occurred about B.C. 2450. An eclipse is recorded at the remote date of B.C. 2167, or about two centuries after the Flood. But all these obser-

vations, equally with their dates, are simply unintelligible, and bear every appearance of having been calculated back; while the first authenticated entry brings us only to the time of Confucius, who, in the fifth century before the Christian era, recorded the eclipses of the preceding three hundred years, thirty-six in number. From that time, astronomy was assiduously cultivated by the Chinese, and about two centuries later the reigning Emperor instituted a mathematical tribunal, which awarded the highest posts in the empire to successful students of astronomy.

The merit of early proficiency in the celestial science may legitimately be accorded to the Phœnicians, who, above all others, were the founders of astronomy. There is certain evidence that they were acquainted with the position of the stars within six centuries from the Flood, when, with this knowledge for their pilot, they ventured on their enterprising voyages, without knowing whither they might lead. From the convex aspect of the sea, they ascertained the sphericity of the earth, and noting their discoveries in secret charts, originated, at one and the same time, the practice of nautical astronomy and of navigation.

The great Thales of Miletus, who flourished about 640 B.C., and whose devotion to science has already been mentioned, was the first to promulgate correct ideas of the structure of the heavens. Penetrating the mysteries of the Egyptian priests, he brought from Egypt all her lore, and, on this basis, erected a new system. He announced the startling doctrines that the moon was not self-luminous, but derived her light from the sun, and that her eclipses were caused by the interposition of the earth's shadow—that the earth, instead of being an expanded plane, was round, and separated into five parts, bounded respectively by the polar circles, the tropics, and the equator, and that the stars were opaque, and formed of the same constituent elements as the earth. These propositions, though wide of the truth, were still a step onward in knowledge, and were so opposed to the general conviction, that, at a later day, they would probably have exposed the philosopher to the most cruel persecution. But his reputation was so great, and the benefits he had conferred on mankind were so incontestable, that the fanatical priests of Greece suffered him to live unmolested, and his century of years was passed in tranquillity and peace. Fortune

combined with science to give lustre to his fame. Standing in the midst of his disciples, he predicted that, on a certain day, the sun would disappear, and the world be wrapped in darkness. The appointed time approached, and brought no sign of disturbance, no indication of change; on the contrary, the face of nature, always serene in that beautiful land, was unusually radiant. The people, though scarcely expecting the event, were ready to jeer at the prediction; the faithful disciples were confounded; the philosopher alone retained his confidence. Suddenly the sky became overcast; the light rolled up like a cloud; the sun had gone. As on a similar occasion the wild Caribs fell at the feet of Columbus, so now all rushed, in horror and consternation, to the dwelling of Thales. The venerable sage quieted their fears, and explained the secret cause of the phenomenon. A few hours verified his exposition; the sun came forth as a bridegroom out of his chamber; and all misgiving was dispelled.

Thirty years later the renowned Anaximander, who had been brought up at the feet of Thales, advanced the standard of science to still loftier heights. To the eye of this mighty philosopher, the heavens seem to have

opened, and disclosed their most intricate mysteries. By a sort of inspiration, he arrived at the conclusion that the fixed stars were the suns of other systems, possibly of vaster dimensions than our own, and that the five planets were worlds, inhabited by animated beings. The sun he considered to be a globe of fire, extending its light to the other planets, as well as to the earth, which, in point of size, he described as only a small part of the sun's bulk. He gave the earth an axis, which he placed in its centre, and thus set the prodigious mass in motion, an attendant on the sun in its march through the skies.

Anaxagoras, who flourished a century later, B.C. 500, shared the opinion of Anaximander as to the composition and structure of the sun, and, pursuing his investigations, announced a new doctrine respecting the moon. This he described as a world like our own; diversified by mountains and valleys, continents and seas, and, as a consequence, tenanted by living beings. He discovered the true character of the Milky Way, considering its light to emanate from a mass of stars, undistinguishable from distance; and, in fine, promulgated a theory concerning comets, pronouncing those bodies, which excited such terror in the early

world, as trains of stars, which swept through the heavens at appointed periods. Such views astonished the vulgar, and provoked the superstitious. The philosopher, who sought to enlighten and instruct mankind, was accused of impiety, and denounced as an enemy of the gods. He was cited before the Areopagus, tried, convicted, and condemned. The multitude awaited his execution with noisy impatience, convinced of the guilt of an offender to whom they could impute no crime; but Pericles, by his eloquent pleading, obtained a commutation of the sentence, and the researches of Anaxagoras were only punished with banishment.

The school of Thales produced a still more illustrious pupil in Pythagoras, a contemporary of Anaxagoras, and who, both in science and philosophy, caught the mantle of their master. Initiated in the mysteries of knowledge, and burning with the ardour they inspired, this august man sought to inform his mind and augment its attainments by visiting distant countries, and making himself acquainted with their systems of philosophy, their practice of the arts and sciences, and their different religious tenets, for which purpose, while still in the flower of manhood,

he proceeded to the most remote regions, crossing seas and deserts, undismayed by danger, and undeterred by difficulty. Phœnicia, Arabia, and Chaldea were successively visited; and, after collecting the lore of central Asia, the enterprising student penetrated to India, and mastered the unknown learning of the Brahmins. Retracing his steps, he repaired to Egypt, where the priests, in spite of their jealousy of foreigners, were so captivated by his eloquence and address, that they imparted to him all their acquirements. But it was not only in schools and colleges that he sought information, and prosecuted his researches. As he pursued his various journeys, through the lonely defile, or across the arid plain, by day and by night, his eye and mind were ever alert, scanning the face of nature, investigating its features, characteristics, and laws. The solitary mountain afforded him an observatory, whence he measured—by what means we shall never know—the different altitudes of the stars at distant points of the earth, and thus arrived at the conclusion that the world was round; even the sea opened to him a field for inquiry, attracting him by its wonders, and luring him by its immensity.

The intellectual faculties of Pythagoras were enhanced by his personal beauty, and the singular vigour of his body. He was several times the victor in the Olympic games; and while he was crowned in the circus for his performances as an athlete, was, in honour of his mental pre-eminence, saluted by a public assembly with the designation of *Sophist*, or *Wise Man*. That appellation, however, he declined to accept, preferring the more modest title of *Philosopher*, or *Friend of Wisdom*, and this he will continue to receive till the end of time.

The astronomical explorations of Pythagoras were wide and searching, leading him to conclusions of extraordinary magnitude. He originated the doctrine of a plurality of worlds; ranged the planets, as they were then known, in a separate system, of which the sun was the centre, and, what was more startling to the mind of antiquity, ascribed to the earth a diurnal revolution, accounting for the phenomenon of day and night. Principles so novel could not be openly promulgated, since, as in the case of Anaxagoras, they would have entailed a charge of impiety, exposing their propounder to the penalty of death; and it was possibly from apprehension of such results

that Pythagoras eventually quitted Samos, his native place, and established himself in Italy. Even here, science was distrusted and watched. But a few eager disciples, at the risk of denunciation, gathered round the philosopher in the dead of the night, in a sequestered cavern, or subterraneous chamber; and the aspirant after knowledge was admitted into their society by solemn mysteries, binding him to secrecy by an oath.

The conclusions of Pythagoras, though they form the basis and platform of modern astronomy, are associated with some fanciful errors, such as impregnated all his doctrines. Touched by the sublime concord of nature, he gave it a voice and utterance, conceiving that the vault of heaven resounded with celestial music, emitted by the earth and planets, as they marched rejoicing in solid spheres round the sun. This became a leading principle of his system, and while its great discoveries were rejected, the poetic fable of the harmony of the spheres was received as an article of popular belief.

Astronomy owed little to the labours of Plato, who, with less analytical power, had all the imagination, as he had all the sagacity of Pythagoras. This illustrious man was

born at Athens, B.C. 417, and, in his youth, bore the name of Aristocles, but was afterwards called Plato from the breadth of his shoulders. As he was of noble family, great attention was paid to his education, which extended to all the learning and accomplishments of the time; and, in compliance with the prevailing usage, he was also trained in gymnastic exercises, that his body might be equally disciplined with his mind. His poetic temperament was developed by the beautiful science of geometry, which so expands and invigorates the faculties; and before he had crossed the threshold of manhood, his genius exhibited itself in several poems and tragedies, replete with the fervour, if not the inspiration of poetry. But at the age of twenty, when he was introduced to Socrates, he committed these early effusions to the flames, convinced by the studies now opened to him that they could not be compared with the productions of those glorious spirits, who were already throned on the heights of Parnassus. He diligently attended his great master, imbibing all the wisdom of those oracular lips; and it may be deplored that he was prevented by illness from being present at his death, a scene which, though he

has faithfully described it from report, he could have so much better delineated from observation, and which was worthy of so sublime a witness. A timely retreat from Athens probably preserved his own life, and, availing himself of the occasion to travel, he made the tour of Greece, visited Egypt, and thence proceeded to Sicily, where, attracted by the volcanic phenomena, he passed some time in closely examining Ætna. It may have been at this period that he formed the acquaintance of Dionysius II., the ruler of Sicily, whom, though a cruel and ferocious tyrant, he persuaded to become the friend of mankind, and the father of his people. During his travels, Plato came in contact with the disciples of Pythagoras, who infected him with their belief, particularly their leading tenet of metempsychosis, or transmigration of souls; and he it was who introduced the doctrine that the dead are born from the living and the living from the dead.

Plato has, as it were, dramatised his system in his dialogues, which, after an interval of more than two thousand years, still by their intrinsic beauty, their depth of thought and fancy, and their felicity of expression, almost justify the praise of the ancients, who pro-

nounced them divine. His other works are twelve epistles, distinguished by the same elegant style, and the same exquisite taste. The invariable sweetness of his diction became a proverb, and acquired for him the name of *the Athenian bee*, a flattering appellation, but which was not more eulogistic than just.

Unlike Pythagoras, who was dogmatic in his opinions, and rather courted observation, Plato was modest in his demeanour, and simple and retiring in his habits. It is related that when, in the zenith of his fame, he attended the Olympian games, he took up his residence with an humble family as one of their own class, and, during his stay, lived with them on equal terms. At the conclusion of the festival, the family accompanied him to Athens, and, as the greatest wonder of the city, desired to see Plato, when they were amazed to learn that their modest companion was himself the philosopher.

The last years of Plato's life were spent in tranquil meditation, in the classic groves of the Academy, and here, on his eighty-first birthday, he closed his earthly existence. He is said to have expired at an entertainment, probably given by his friends in commemoration of the day; and all agree that he closed

his eyes with supreme composure, confident in the immortality of the soul, though wholly mistaken as to its destiny.

Following Pythagoras in some of his fundamental errors, Plato rejected his astronomy. To the eye of modern science, his own theory is simply absurd, as he considered the world to be a figure of twelve pentagons, and taught that it was sustained by a pyramid of fire, to which it was knit by *numbers!* But he lived in an age in which the guide of mankind was conjecture, and when imagination, so prone to error, usurped the place of inquiry,

The astronomical system of Pythagoras was also repudiated by Aristotle, who, about B.C. 360, succeeded to the vacant chair of Plato. Reverting to the old delusion that the earth was the centre of the universe, Aristotle, while he adhered to a traditional fallacy, still scanned the heavens with an eagle eye, observing their phenomena with diligence, and recording them with accuracy. He appeared at a juncture when nature specially demanded an expounder of her mysteries. In imagination, we may carry ourselves back to the time when, as night fell on the earth, a cry of terror burst from all mankind. Let us see the classic metropolis startled from its repose,

panic-stricken crowds thronging the streets, and every eye bent on a fearful comet, which, spreading its train across the heavens, covers a third of the sphere. The affrighted populace gather round the dwelling of the philosopher, who stands calm and unmoved, watching the portentous spectacle; and from his lips they learn there is no cause for disquietude, and that what they observe is but a host of stars, revolving round an appointed orbit.

Doubtless it was the prodigious magnitude of this visitant that led Aristotle to apply the same character to the Milky Way, which he classed as a comet, and pronounced all comets to be exhalations. His other opinions were equally erroneous; but astronomy was advanced by the registry of his observations, which include a remarkable occultation of one of the stars of Gemini, traced back by Kepler to the year 357 B.C.

From the time of Aristotle, the celestial science received no augmentation of importance till the foundation of the school of Alexandria, under Ptolemy Soter, B.C. 300, when it was launched into wider explorations, opening a new epoch. Hitherto the sun, moon, earth, and stars had been jumbled

together, at one time all in motion, at another stationary: now chaos was to be reduced to order; and, though a fatal error still prevailed, at least the symmetry, the beautiful equilibrium, of Creation was to be vindicated.

The father of the new system was Hipparchus, who, though not trained in Egypt, doubtless profited by the labours of the Alexandrian philosophers, as well as those of Pythagoras and Thales. His own observations were unremitting, and were fruitful of results. He made a catalogue of the principal stars, 1081 in number, fixing their position in the heavens; and this precious record has proved one of the greatest acquisitions of astronomy. The varying aspects of a tree on a plain, seen from different points, led him to a discovery of the parallax, or distance between the real and apparent position of the planets, observed from the centre and the surface of the earth; and he first discovered the length of the interval between the vernal and autumnal equinox, deducing from it the eccentricity of the earth's orbit. In his astronomical problems, he shadowed forth the elements of trigonometry, so essential to the development of the science; and, as before remarked, he determined lati-

tude and longitude, fixing the first degree of longitude at the Canaries, B.C. 120.

The whole Alexandrian system was reduced to order and given a permanent form by Ptolemy Claudius, about A.D. 140; and, under his name, maintained its ascendancy for fourteen centuries. Ptolemy, abjuring the Pythagorean doctrine, made the earth the pivot of the universe, rotating the sun, moon, planets, and starry host round this common centre, and accounting for the irregularity in the movements of the sun and moon by the eccentric position of the earth in their orbits, and for the perturbations of the planets by an ingenious theory of cycles and epicycles, which, ascribing to those bodies an uniform progress in the circumference of a small circle, whose centre moved in the circumference of a large one, itself centred near the location of the earth, satisfactorily explained all the celestial phenomena then known, and, indeed, effected such an adjustment of the planetary orbs, that tables of their motions could be computed at any period, and with an accuracy that never erred. The system was not originated by Ptolemy, but had been introduced by Apollonius, exactly three centuries before.

From the earliest ages, astronomers experienced little difficulty in fixing limits to the year, though it was soon discovered, from successive revolutions of the sun, that these were far from accurate, and various expedients were adopted to preserve the balance of time. The Chaldeans gave the sidereal year 365 days 6 hours and 11 minutes; and allotted 365 days 5 hours 49 minutes and 30 seconds to the tropical year. Egypt, whether from calculation or accident, maintained the measurement established in modern times, awarding the year 365 days 6 hours. The Persians took the same term, less the hours, and, to preserve equation, introduced an intercalary month every 120 years. The Grecian calendar was perpetually varying, till Meton, about B.C. 433, produced his celebrated work *Enneadecaterides, or, The Cycle of Nineteen Years,* in which he announced the doctrine that, after such an interval of time, the solar and lunar years commenced at the same point in the heavens. The Metonic period, as it was called, or, to use a more familiar designation, the Golden Number, ultimately came into general use; and all chronological disorder was now obviated.

The Roman year was regulated by Julius

Cæsar, just before the commencement of the Christian era:

> 'Amidst the hurry of tumultuous war,
> The stars, the gods, the heavens were still his care.'

With the assistance of Sosigenes, an Egyptian astronomer, he endeavoured to restore equilibrium to the calendar, by giving, every fourth year, an additional day to February, reckoning the sixth day before the kalends of March twice, and hence conferring the name of *Bissextile* on the year, which thus consisted of 366 days. We shall hereafter see that this correction was inaccurate, but, imposed by the Roman power, it continued in force till 1582, when the calendar was again reformed.

In tracing the astronomy of the ancients, we have necessarily touched on their ideas of cosmogony, which is a lateral ramification of the celestial science; and this seems the proper place to continue the subject, and state, as accurately as possible, what were the received opinions.

Our earliest information is drawn from the Holy Scriptures, in which the facts, when not expressed in metaphor, are very plainly stated, and with unvarying correctness. Job, indeed, speaking of the power of God, describes it as shaking 'the earth out of its place, and the

pillars thereof tremble,'[56] which might induce an impression, that he supposed the world to be supported by pillars; but here he is using only a beautiful poetic simile, and not speaking by the book. The same figure he afterwards applies to the sky, observing that 'The pillars of heaven tremble;'[57] but on this occasion he mentions the Deity as one who 'stretcheth out the north over the empty place, and *hangeth the earth upon nothing.*'[58] God himself announces the same doctrine, inquiring of the Patriarch 'whereupon are the foundations thereof fastened?'[59] Frequent allusion is made to the various winds which prevail in the East. The rich man, reposing in fancied security, is destroyed by the Euroclydon,[60] a wind extremely violent, and known in the Mediterranean as the sirocco. 'Scorching blasts' aptly describe the simoom, which Isaiah, in his denunciation of Babylon, calls 'whirlwinds of the south; it cometh from the desert, from a terrible land.'[61] It is also referred to by David, in Psalm lxxviii., and was, indeed, but too familiar to the Jewish people, who often suffered from its ravages.

Job and his friends appear to have had

[56] Job ix. 6. [57] Job xxvi. 11. [58] Job xxvi. 7.
[59] Job xxxviii. 6. [60] Job xxvii. 20. [61] Isaiah xxi. 1.

little knowledge of the causes which produce and regulate the various natural phenomena. Light and darkness, snow, hail, and frost, lightning and thunder, the sublime effects of immutable laws, were to them inscrutable operations, emanating directly, instead of vicariously, from the Divine Hand. They seem to have been unable even to form a conjecture as to the origin of dew; for the Almighty, in his address to Job, asks 'who hath begotten it;' and, indeed, to this day philosophers are undecided as to whether dew is an exhalation from the earth, or a precipitation from the atmosphere. Clouds are designated 'the bottles of heaven,' showing that something was known of the source of rain; and its seasonable prevalence, in the spring and fall, is mentioned as 'the early and the latter rain.' There is a forcible description of an earthquake, which 'removeth the mountains and they know not, which overturneth them in his anger, which shaketh the earth out of her place.'[62] But neither Job nor his companions make any reference to volcanoes, whence we may reasonably conclude that they were unacquainted with their existence, and, consequently, had no

[62] Job ix. 5.

knowledge of their subterraneous action on the surface of the earth.

Pliny has left us, in his *Natural History*, a careful digest of the cosmogony of the ancients, which evinces the little progress they had made in that interesting science. True it is that nature was yet veiled from mortal gaze, veiled by clouds and darkness, by ignorance, tradition, and superstition. Then, indeed, as now, she stood up naked, revealing her history in her aspect, even proclaiming it by mighty phenomena. But mankind would only see her darkly, as through a glass—the glass of their preconceived opinions, measuring everything by their own narrow gauge, and pronouncing every deviation from this beaten track audacious and impious.

Pliny notes most of the extraordinary phenomena of which there is any account, either from history or tradition, and occasionally attempts a crude explanation of their character. He describes the figure of the earth, which he announces to be a globe, bounded by the poles; and considers that, as the centre of the universe, it supports the heavens, which rise from it in a convex form, like a dome.[63] He expresses his belief in the existence of antipodes,[64] who stand with their feet towards

[63] Lib. ii. 64. [64] Ib.

the feet of the inhabitants of Europe; and, in reference to their stability on the earth, he quaintly observes—'If any one inquire why they do not fall, I ask in reply whether they, on their side, do not marvel that we do not fall.' He states the world to be pendent, but cannot decide whether it retains this position by some innate quality, by the spirit embalmed in the universe, or whether the result is owing to its situation, and because it is everywhere met by repulsion.[65] The ponderous mass is described as surrounded by water, as if it were an island in the midst of a boundless ocean; and this, adds the philosopher, 'is not a point to be investigated by arguments, for it has been certified by experience!'[66]

Pliny was aware of the superior velocity of light, though unacquainted with its precise rate of transit. When he beheld the lightning, he knew that, though first to reach the earth, its emission was simultaneous with the thunderclap, whose awful vibrations were still on their way.[67] He credulously remarks that 'thunder on the left hand is believed to be lucky;'[68] and his theory of electricity consists in ascribing thunderbolts to the planet Jupiter, because, from all he had observed, it appeared to him that the redundance of moisture in the

[65] Lib. ii. 65. [66] Lib. ii. 66. [67] Lib. ii. 55. [68] Ib.

vast orbit of Saturn, and the excess of heat in that of Mars, commingled in the sphere of that brilliant orb, and here formed a foundry for the ordnance of Heaven.[69] The same three planets were considered by the Babylonians to be the cause of earthquakes. Pliny, however, relieves them of this imputation, ascribing those prodigious convulsions to the winds,[70] observing that, though the weather at the time is sultry, they are invariably preceded by tempestuous gales, which he conceives to have become pent up in the fissures and cavities of the earth, till, by a simultaneous rush, they break from their prison, rending its bars in sunder.[71] So near was conjecture to a right solution of the phenomenon; for modern science has established, that it is precisely by such an operation, generated in the interior of the globe, that gaseous emanations produce the earthquake!

Aristotle had induced the great Alexander to appoint two thousand men to attend the animals obtained in his Eastern expedition, for the purpose of acquiring a knowledge of their habits, instincts, and nature; by this means he was furnished with a mass of important information, which he embodied in his

[69] Lib. ii. 17. [70] Lib. ii. 81. [71] Ib.

natural history.[72] A record so ample and so authoritative could not be overlooked by Pliny, and he has evidently made it the basis of his work, adding facts from other sources, but very little from his own observation. He thus presents us with a view of the science, as it was understood in the days of Rome's greatness; and, with many valuable and interesting details, preserves the fables of remote ages. We are told of the season when crows, usually birds of ill omen, are not inauspicious,[73] and when halcyons exercise a soothing influence on the sea;[74] of a cock that once spoke,[75] and of the self-generation of the phœnix,[76] which the author, it is true, acknowledges that he is 'not quite sure of.' The fishes of that period seem to have been as great prodigies as the birds; and the dervish who interpreted to the Arabian caliph the conversations of animals, might, in the age of Pliny, have himself discoursed with the exocætus, a wonderful fish of the river Clitorius, which was endued with the faculty of speech.[77] The difficulty was to catch the gifted monster in a talking mood; for Pausanias admits that he never heard it speak,

[72] 'Historia Animalium.'
[73] 'Nat. Hist.,' lib. x. 14.
[74] 'Nat. Hist.,' lib. x. 47.
[75] 'Nat. Hist.,' lib. x. 25.
[76] 'Nat. Hist.,' lib. x. 2.
[77] Lib. ix. 34.

though he often went to the banks of the river to listen! It appears, indeed, to have been as shy in its nature as the famous sea serpent of our own times, and may even have been the same animal!

In his terrestrial menagerie, Pliny equals the wonders of the sea and air, introducing us, without scruple, to dragons,[78] flying serpents,[79] basilisks,[80] and animals that kill, more fatally than any lady, with a glance of their eye.[81] His nereid and triton correspond with the mermaid and merman of modern fables, and were a sort of amphibious animals, combining the human form with that of a fish. He gives a circumstantial account of their habits and characteristics,[82] remarking that 'the figure ascribed to them is not fictitious, having been established by testimony above dispute;' and, among other proofs, he instances the skeleton of the monster to which Andromeda was chained, and which he affirms was brought from Joppa by Æmilius and Scaurus, and publicly exhibited at Rome.[83]

Such was the character of the acquisitions which the human mind attained, in a wide range of science and knowledge. We behold

[78] Lib. viii. 14. [79] Lib. viii. 35. [80] Lib. viii. 33.
[81] Lib. viii. 32. [82] Lib. ix. 4. [83] Ibid.

it from the first groping up the rugged ascent of Parnassus, bewildered and benighted. Its way is crossed by torrents of delusive opinions, intersected by chasms, and impeded by ravines and precipices. Too frequently the step falters, and the foot slips. But onward, through the rushing flood, and over rocks and quagmires, over heights and depths, it steadily pursues its march, never daunted, though often misled, and, like Longfellow's pilgrim, still always crying *Excelsior!*

The great barrier to intellectual progress was the promulgation, in very remote times, of certain fundamental errors, which, coming to be regarded as incontrovertible truths, were accepted as articles of religion. Hence they became consecrated and canonized: it was impiety to doubt, and sacrilege to dispute them. Any absurdity might be enunciated, so long as the primary delusions were untouched; but these, as the seeds of religious faith, must be kernelled in every hypothesis. To turn the sun into a stone was allowable; but to give motion to the earth, was to shake, not only the foundations of society, but the thrones of the gods.

Manifestly, therefore, priestly ascendancy operated prejudicially on the human mind.

But we must be careful to fix a limit to this conclusion, which is not unaffected by qualifications. If the priests constituted themselves the keepers, we cannot forget that they were also the founders of knowledge, and, while they habitually opposed its diffusion, they were the most active dispensers of its benefits. Antiquity was indebted to priests for its palaces and temples, its great discoveries in science, its astronomical observations, and its authentic history. For many ages they had been surrounded by a wall of mysticism and prejudice, by which they were separated from their species; but, like the once famous wall of China, this barrier was great rather in name than fact, and by no means invulnerable. As time wore on, and classes and nations were brought nearer by commerce, and by mutual requirements, they began to awake to the tendencies of society; and the day approached when priestly jealousy was to be dispelled by the generous promptings of nature. Greece, foremost in the van of civilization, sent her sons on missions of inquiry and observation; and Egypt unlocked her treasures to the accomplished strangers.

But, before we proceed farther, it is necessary to contemplate the night side of science;

to see the human mind in its fetters, as the slave of superstition, credulity, and imposture, and enveloped by darkness which, from some points of view, was not more impenetrable to the gaze of antiquity, than it is to the eye of modern inquiry.

III.

THE BLACK ART.

THE human mind is ever craving for the unknown. This, in fact, is the great law of its faculties, prompting it to those studies and researches, which, in the course of time, have led to such wonderful results. But we are attracted to the mystic, as well as the practical; and a perverse disposition usually takes the former direction, seeing a strange fascination in forbidden lore. The Father of Evil soon discovered this common infirmity of man; and when he promised our first parents that their eyes should be opened, and that they should know both good and evil, his object was already gained. The wide domain of lawful knowledge does not content us. The discoveries of science, the achievements of art, and the miracles they equally accomplish, are deemed poor and impotent by the side of results, which seem to transcend the ordinary operations of nature. But it is the future, the hidden, the unseen—it is the time

to come and the invisible world, veiled from us by the immutable decrees of Heaven, that we are ever seeking to penetrate. We forget that, could the pages of fate be turned at our will, destiny and society and existence could have no mission—

> 'If this were seen
> The happiest youth—viewing his progress through,
> What perils past, what crosses to ensue—
> Would shut the book, and sit him down and die.'

Magic, sorcery, palmistry, divination, and soothsaying, all branches of the black art, with oneirocriticism, or interpretation of dreams, have been practised from the earliest time; and, putting aside every other testimony, Holy Writ affords incontestable evidence that they were anciently carried to a degree of perfection which we can neither explain nor comprehend. It is not known when astrology was originated, but doubtless it was at a very remote period, as the stars, from the moment they began to be observed, were universally regarded as the arbiters of fate. Magic is said to have been invented by Zoroaster, whence his followers took the name of Magi; but placing the era of the Persian sage at the earliest credible date, as a contemporary of Moses, B.C. 1550, we find that

magicians existed in Egypt more than two centuries before, holding an established position at the court of Pharaoh in the time of Joseph, B.C. 1720. Joseph himself was skilled in the interpretation of dreams, and had evidently made a study of the science, since we find him relating and interpreting dreams in three separate instances.[1] Certain it is, that nocturnal visions, whether in consequence of the prevailing belief, or the facilities they afforded, were repeatedly chosen by the Deity as a medium of communication with man, and, on different occasions, were made vehicles alike of revelation, of guidance, and of warning. The dreams of Joseph himself, those of his fellow-captives and Pharaoh, of Nebuchadnezzar and Belshazzar, and, coming to the Christian era, those of the wise men, of Joseph the carpenter, and of St. Paul, not to mention other examples in the sacred volume, all come under one of these categories. Nor is it incredible that such a link between man and providence should be maintained to our own day. True, the phenomena of dreams are generally referable to previous occurrences, still harassing or haunting the mind; but there are few who cannot

[1] Gen. xxxvii. 5; xl. 5; xli. 15.

recall special visions, which stand out bold and prominent, leaving the impression of real experiences, and seeming to have foreshadowed incidents that followed. Although, then, we may usually be disposed to exclaim with Shakspeare—

> 'Dreams are the children of an idle brain,
> Begot of nothing but vain Fantasy,'

it must be confessed that there is something to be said in favour of a belief in specific manifestations, though it perhaps appeals rather to our perceptions than our reason.

The first recorded exercise of magic occurred at the court of Pharaoh, about B.C. 1490, when Aaron, in obedience to the Divine injunction, threw down his rod before the King, and it was transformed into a serpent; on which, we are told, 'Pharaoh also called the wise men and the sorcerers; now the magicians of Egypt, they also did in like manner with their enchantments, for they cast down every man his rod, and they became serpents, but Aaron's rod swallowed up their rods.'[2] The second miracle of the Hebrew priest was imitated with equal success; for no sooner had he turned the river into blood, than 'the magicians of Egypt did so with

[2] Ex. vii. 11, 12.

their enchantments.'[3] On the occasion of the plague of frogs, Pharaoh again tried their skill, and, like Aaron, 'they brought up frogs upon the land of Egypt.'[4] Their mysterious powers, however, were completely baffled by the plague of lice; for in responding to the King's summons, they were unable to produce the same effect, and they declared this new miracle to be 'the finger of God.'[5] From this time, they appear to have given up the contest, nor did Pharaoh again call upon them to exercise their art, the superiority of Aaron being conclusively established.

But their previous performances were sufficiently wonderful; and cannot be accounted for by supposing them to have been the mere effect of jugglery or collusion, as some ingenious commentators have endeavoured to prove. Moses, indeed, guards us against such a conclusion, by stating that the result was actually produced, which removes all suspicion of imposture. It seems more reasonable to believe that the primitive necromancers were aided by demons, and this impression was early prevalent among mankind, and is even warranted by Holy Writ. Isaiah, B.C. 757, speaks of those who 'have

[3] Ex. vii. 22. [4] Ex. viii. 7. [5] Ex. viii. 19.

familiar spirits, and of wizards that peep and that mutter;"[6] and, in another passage, he even describes the *modus operandi* of the demon—"Thy voice shall be as of one that hath a familiar spirit, out of the ground, and thy speech shall whisper out of the dust."[7] About three hundred years earlier, we are introduced to a Jewish sorceress, exercising the most extraordinary powers. The Witch of Endor offers a notable example of the employment by human beings of spiritual agencies, to accomplish supernatural results. As in the case of the Egyptian magicians, there is no room left for ascribing the effect to jugglery or optical illusion, since the sacred narrative is still precise in affirming that it was positively accomplished. Imagination recurs to the weird scene with an interest undiminished by its familiarity or distance. The disguised and stricken King, in his last desperate extremity, entering the lair of the fugitive witch, whose art he had interdicted, is a touching picture of fallen majesty. He makes known his errand; and, after some demur, her scruples are overcome, and she complies with his wishes. The unrecorded spell is pronounced, and, as she informs Saul,

[6] Isaiah viii. 19. [7] Isaiah xxix. 4.

'an old man cometh up, covered with a mantle;' the King recognises the form of Samuel; he bends to the earth before the phantom, and an awful colloquy ensues. Here is no deception. The Endor enchantress, by her magical incantations, recalls the dead seer to the earth; and his identity is established by his bodily semblance, by his mien and voice, and by his divine gift of prophecy.

When, B.C. 1720, Joseph appeared before Pharaoh,[8] the black art had probably not been fully developed, as the magicians of that day were unable, by their united cunning, to unravel the King's dream. At different periods, we find magicians in other Eastern countries, in Babylon, Chaldea, and Persia; and Balaam, the renegade prophet, marks their presence in the camp of Balak, where he went 'to seek for enchantments'[9] before delivering his oracles. These he sought to elicit by divination,[10] for which he appears to have looked in the entrails of the numerous bullocks successively offered for sacrifice, but an innate overruling impulse, not to be resisted by human will, drove him to seek the Deity. Divina-

[8] Gen. xli. 8. [9] Num. xxiv. 1.
[10] Num. xxii. 7; xxxiii. 3.

tion is frequently referred to in the Scriptures, as the means everywhere in use among pagan nations for obtaining supernatural knowledge, and eliciting the dark secrets of futurity. It thus became a religious usage, and, in the East, was chiefly practised by priests; but the Romans restricted its exercise to two special orders—the Haruspex, who searched for their omens in the entrails of animals;[11] and the Augurs, who drew their inspiration either from the appearances of nature, or from incidents occurring at the moment of sacrifice.[12] The Augurs, originally only three in number, were a new order, instituted by Romulus; but the Aruspices were borrowed from the Etrurians, whence we may conclude that divination had been practised in Europe, as well as in Asia, from time immemorial. Among the Greeks, the craft was left open, and, when St. Paul was traversing Macedonia, a prayer-meeting of Christians was interrupted by 'a certain damsel, possessed with a spirit of divination, which brought her masters much gain by soothsaying.'[13] Here the supernatural element is specially recognised, and up to this period, there is undoubtedly Scriptural authority for admitting

[11] Ci. Di. [12] Ci. Di., liv. i. [13] Acts xvi. 16.

the intervention of evil spirits in human affairs. It is as difficult to state when their direct action was suspended, as it is to fix the date of the termination of miracles, but there is some ground for believing that both the one and the other occurred simultaneously, on the diffusion of Christianity by the Apostles; and that divination, magic, witchcraft, all the branches of the black art, lost their vitality and supernatural impulse, when the gift of miracles was withdrawn from the Church. Certain it is, that they were rigorously proscribed by St. Paul, and we are told that, during his stay at Ephesus, 'many which used curious arts brought their books together, and burned them before all men, and they counted the price of them, and found it fifty thousand pieces of silver.'[14]

Divination by astrology was chiefly adopted by the Chaldeans, by whom it was originated; but, in later times, the Roman Augurs occasionally practised the science. The Greeks, so skilled in astronomy, were also famed as astrologers; and some of their greatest philosophers believed in the signs of the heavenly bodies, and their influence on destiny. This delusion was especially countenanced by the

[14] Acts xix. 19.

Pythagoreans; and the Emperor Tiberius was instructed in 'the Chaldean art' by Thrasyllus, a Pythagorean luminary.[15] Juvenal informs us that the calendar of Thrasyllus was in high repute at Rome, and, in his time, no patrician dame would engage in any important transaction without previously referring to this oracle.[16] Petosyris, who united the crafts of astrologer and physician, was deemed equally infallible, and his manual and horoscopes were universally consulted.[17] Sometimes recourse was had to the more vulgar mode of divination; and a Syrian adept read futurity in the entrails of a bird, a puppy, or a child.[18] The Jewish sorceress, trained at Solyma, also had her believers, but appears to have been recompensed on a lower scale—

> 'For Jews are moderate, and, for farthing fees,
> Will sell what fortune, or what dreams you please.'[19]

Astrology comprised two branches—Natural Astrology, referring simply to prognostications of storms, winds, rains, earthquakes, and other terrestrial disturbances, and which, being founded on prolonged observation of the various physical changes and phenomena, was often not inaccurate; and, secondly, Judicial

[15] Sue. in Tib. [16] Juv. vi. [17] Ib. [18] Ib. [19] Ib.

Astrology, relating to the prediction of events, in connexion with society and individual man. By this science the Heavens were declared to be the open page of fate, on which the Deity had foreshadowed the history of the world, and even the fortunes of every human being, so that, by reference to the stars, any one might learn his destiny, and, perhaps, avoid evils to which he would otherwise be exposed.

Incantations were pronounced with various forms and ceremonies, calculated to impress the beholder. Horace, describing the superstitious practices of his own day, paints a scene which might have been enacted by Macbeth's witches:—

'With yellings dire they fill'd the place,
And hideous pale was either's face.
Soon with their nails they scraped the ground,
And fill'd a magic trench profound
With a black lamb's thick streaming gore,
Whose members with their teeth they tore;
That they might charm the sprites to tell
Some curious anecdotes from hell.'[20]

The priests of Greece ultimately became as proficient as the Egyptians in the black art; and their achievements at the Eleusian mysteries, to which we shall hereafter have to refer, were certainly very marvellous. The earthquake

[20] Francis' Hor.

and tempest which scattered the mighty army of Brennus the Gaul, at the siege of the celebrated temple of Delphos, were ascribed by the credulous Greeks to the magical incantations of the priests, though the latter gave all the credit to Apollo.[21] In modern times, we find no difficulty in imputing them to natural causes, but it must be admitted that, by averting the capture of the Delphian temple, they had all the effect of a miraculous interposition. Apollo, however, offered no such opposition when the rich edifice was despoiled by Nero, and there was neither earthquake nor tempest when it was finally destroyed by Constantine.

Whatever may be thought of the ancient belief in magic, and however inexplicable some of the facts connected with it may appear, we see that the delusion gradually loosened its hold over mankind, dissolving before the light of reason. If we suppose that the powers of darkness designed to use it as a means of enslaving the human race, and keeping it in perpetual bondage, making the universal passion for the mystic and supernatural the strong refuge of superstition, of ignorance, and of barbarism, they have in nothing been more

[21] Stra. Del.

signally worsted. The pursuit of such an occult science necessarily fell to the more enlightened classes, to priests, physicians, astronomers, and mathematicians, who, indeed, to magnify themselves, were too likely to invest it with fictitious might, and minister to popular credulity. But though the great majority countenanced imposture, though they might even believe in their assumed powers, their course of study insensibly led them to wiser conclusions, which, if at first suppressed, or only whispered among a few, were destined to spread abroad, and sap the very foundations of the black art.

This result was not to be accomplished in a day: it was the work of a round of ages. The rock is worn by the drop of water: it is the gentle shower, penetrating the earth, that ultimately forms the river. An insect works unmarked in the depths of the sea, raises the coral reef, and, on this foundation, erects islands, promontories, and peninsulas. Just so has it been with the human intellect. Plodding on and on, in the dark, in the abyss of ignorance, for thousands of years it might seem stationary, but all the time it was making way, depositing layer on layer, and imperceptibly rising, till, at last, it reached the surface, breasted the

waves, and formed the firm ground whereon we stand.

The investigations imposed by astrology were of eminent service to astronomy, involving as they did a close observation of the heavens, of the movements and periods of the celestial bodies, and of all the phenomena of the skies. In the same manner, divination from sacrificial offerings furnished the first rudiments of anatomy. The physician-priest saw in the exposed entrails the internal economy of the animal structure, and, as will be shown in our next chapter, was led to augment his knowledge by examining other animals, dissecting, comparing, and drawing analogies. The diffusion of practical information was a check to the occult sciences; and it is a sure indication of their decline when we find satirical poets, such as Horace and Juvenal, holding them up to derision. They were still more discountenanced by Christianity, in its origin so simple, so pure, and so holy, though Christians soon adopted superstitions of their own, shrines, and relics and charms, from which they expected all the results of magic. Astrology and sorcery, indeed, long maintained their usurpation over human reason; and even so late as the sixteenth century

of the Christian era, they were universally accepted in France, as well in the polished court of Henry the Fourth as in the closet of Catherine de Medicis. But this belongs to a later period; and here we shall only remark, that, even in the midst of the dark ages, a better spirit was not extinct; and when an astrologer who had predicted the success of the Norman expedition was drowned on his passage to England, William the Conqueror shrewdly exclaimed, 'How little could he know of the fate of others when he could not foresee his own!'

IV.

THE HEALING ART.

THERE was profound import, a store of deep meaning and philosophy, in that admonition of the heathen sage to his pupil—Know Thyself! In those benighted days this important branch of knowledge was altogether obscured; and man was not only unacquainted with his origin and destiny, not only uninstructed as to the mechanism of his mind, but was very imperfectly informed of his physical structure. Of the frame which he brought with him into the world, with which he was through life inseparably linked, and which he carried with him to the grave, he knew little or nothing. Its development, its operations, its diseases, its infirmities, appearing continually before his eyes, in his own experience, and addressing themselves to his own sensibility, were, nevertheless, mysteries as great to him as the revolutions of the sun, or the courses of the planets. Night was not more dark than this unexplored body, which imprisoned, rather

than housed a throbbing soul; and humanity lay within as in a dungeon, looking round, but seeing only gloom. The narrow windows of the mind admitted no light from without; and superstition stood, like Death at the infernal gate, a perpetual guard over the interior.

At all times, life is but a thread. In the broad light of science, surrounded by every accessory of medical skill, daily observation still teaches us that we 'fade away suddenly like the grass.' But if such is the experience of modern philosophy, how painfully must the same sentiment have been impressed on the imagination of antiquity. Often man saw his fellow struck down, he knew not how, in the fulness of health and vigour; another perished by a lingering malady, for which there was no apparent cause; others were carried off by diseases before unknown and unheard of. Then came a deadly pestilence, smiting right and left, and depopulating a whole region. Under such visitations, there was no safety but in flight. Cities were deserted; the most endearing ties of nature, giving way before the instinct of self-preservation, were rent asunder; and the sick were abandoned in their agony. At these times, indeed, every

impress of humanity seemed effaced; no one thought but of himself; a horrible licentiousness pervaded society, or, rather, its remains; and high and low, rich and poor, practically realised the philosophy of the Hebrew Sadducees—'Let us eat and drink to-day; for to-morrow we die.'

It is not easy to ascertain when the angel of death was first met by science, lighting among men, with healing on his wings. Nature, by voluntary action, paved the way for its approach, showing the effect of certain operations on the human frame. The alleviation of internal pain by spontaneous purging, vomiting, or bleeding of the nose, prescribed those remedies as a mode of cure, and particular herbs were found to serve as aperients or emetics, while bleeding, as in later ages, was effected by incision, at first resorted to only in extreme cases, but with more boldness as it became familiar. Sickness is generally attended by a distaste for food, to a certain extent enforcing abstinence, which, as appetite returned, would suggest a cautious diet; fever dictates its own treatment, by incessantly craving for cool drinks; other maladies call for warmth, repose, and generous food. We may well suppose that women,

the natural attendants on beds of sickness, were the first physicians, as they were the first nurses; and those who had much experience in this way, gradually acquired practical knowledge of a valuable kind. A person of this character, residing in a primitive community, would naturally be consulted in time of need; she would be entreated to watch by the beds of suffering friends or neighbours; her office of nurse would thus become a calling; and, as years rolled on, her sphere of practice would be greatly enlarged. By such steps we may trace the beneficent art of healing up to an old woman; and it is remarkable that, to this day, any antiquated medical opinions are described as 'old woman's notions,' as if we still preserved a tradition of the practice, after every vestige of it had disappeared.

No long period could have elapsed, indeed, before the medical art must have been studied by men, though it was doubtless in conjunction with other branches of knowledge, which prevented it from becoming an exclusive pursuit. It was not to be expected that so abstruse a science could be much advanced under such conditions; and, in fact, it remained for ages stationary. Yet another remedial agent was

developed, in the beneficial effects elicited from the imagination. Sickness, interrupting the ordinary functions of the system, necessarily produces depression, which is itself an obstacle to recovery; and the primitive physician had first to minister to the diseased mind, before he could perform a cure on the body. Hence arose the use of charms and incantations, which raised the drooping spirits of the patient, by securing, as it seemed, the intervention of supernatural means; and this appeal to the imagination was often attended with such success, that the magical formulæ, to which the result was ascribed, came to be considered infallible.

The first mention of the medical art is in *Genesis*, about four centuries after the Flood, when we are informed that the patriarch Joseph commanded his servants the physicians to embalm the body of his father.[1] This gives the origin of the science to the Egyptians, and implies that the process of embalment, which that unique people so successfully practised, devolved on the physicians. We are at once persuaded that persons charged with the conservation of the living, as well as the bodily preservation of the dead, would not

[1] Gen. l. 2.

neglect such an opportunity of studying the human frame. But, on further inquiry, it appears that the embalmers had no part in the manipular preparation of the body, which was undertaken by another class, who, on account of their loathsome occupation, were held in universal abhorrence, while the embalmers were invariably treated with the highest respect.[2] Nor was the corpse opened at all, as we learn from the narrative of Herodotus,[3] who describes, with his usual fidelity and minuteness, each of the several modes of embalment in use among the Egyptians; and it hence appears that the sole duty of the physicians was to inject the preserving fluid into the corpse, after the extraction of the intestines. Doubtless these operators were priests, and, conjoined with their sacerdotal and sepulchral functions, the exercise of the healing art, which, as then understood, was founded on no practical acquaintance with the constitution and structure of the human body.

The medical system of Moses appears to have depended chiefly on seclusion, cleanliness, and diet. It has preserved to us a very

[2] 'Ancient Egyptians,' vol. ii. 119.
[3] Herod. lib. ii. 86, 87.

minute detail of the various types and symptoms of leprosy,[4] but prescribes no particular treatment beyond certain acts of purification, care being taken, however, to prevent contagion, by separating the infected from the healthy, which is the first mention in history of the institution of quarantine. Moses is so fearful of affording a sanction to the Egyptian practice of charms, that, contrary to his usage, he introduces no religious ceremony in connection with the disease, and it was not till the leper was cured that he made a thank-offering, and joined the priest in a sacrifice. Medical science, though it adhered to the prophet's injunctions, must subsequently have been made a special pursuit by the Jews, since we read of King Asa consulting 'the physicians,'[5] B.C. 950; and in Arabia, physicians were known as early as B.C. 1670, being mentioned by Job, who, in one of his bitter harangues, exclaims—'Ye are all bad physicians and curers of maladies.' Strange to say, little attention was paid to medicine by the Babylonians, who were so assiduous in their pursuit of knowledge: and Herodotus, on visiting the great city, found that the only practice followed was for persons afflicted with

[4] Leviticus xiii. xiv. [5] 2 Chron. xvi. 12.

diseases to take their stand in some public spot, where passers-by inquired into their ailments, and communicated their experience under similar visitations—a custom, it may be observed, which still prevails in many parts of the East.[6] The Babylonians embalmed their dead in honey.[7]

Possibly Babylon had nothing to lament in its dearth of physicians; for neither in Asia nor Egypt did the faculty make any discoveries, or attempt to amplify the scanty stock of traditional knowledge. It was in Greece, where the sciences had a second birth, that the practice of medicine was first based on methodical principles. Little is known of the sage who conferred this blessing on the human race—so little, indeed, that his very existence is enveloped in fable. Nor is such a result surprising, bearing in mind that he flourished before the foundation of history, about 1300 B.C., or little more than a century and a half later than Moses. The Greeks, with their usual veneration for science, gave to Æsculapius a divine origin; and he was said to be the son of Apollo by a certain Larissa, a damsel more beautiful than chaste. To preserve her reputation she concealed his

[6] Herod. i. 197. [7] Ibid.

birth, and, carrying him clandestinely from the city, left him exposed on the brow of a mountain, where a stray goat afforded him sustenance, and he was protected from injury by a dog. In due time he was discovered by the owner of the flock, who reared him as his son; and on the steep mountain side, while tending the goats of his adopted father, he became acquainted with the medicinal virtues of numerous plants, previously considered of no value. He was afterwards physician to the Argonauts, and is supposed to have lived about the period of the Trojan war, as two of his sons, Machaon and Poladirus, are specifically mentioned by Homer in his roll of the Army as good physicians; and he is said to have been eighteen generations anterior to the second Hippocrates. Mythology affirms that he raised the dead, by which we are to understand that he could effect a cure in the last extremity. According to the fable, this provoked the jealousy of Jupiter, who, at the instigation of Pluto, struck him with a thunderbolt, and thus put an end to his career. After death, he was elevated into the Pantheon as the god of medicine; and here he was subsequently joined by his daughter Hygeia, who obtained the appellation of god-

dess of health. The nature of Hygeia's practice is not stated; but from the fact of her being worshipped principally by matrons, with whom it was customary to make her an offering of their hair, I venture on the conclusion that it was limited to midwifery. The statues of both father and daughter were represented with serpents, as an emblem of their superior wisdom.

The family of Æsculapius were appointed priests of his temple, and adopted the practice of medicine as an hereditary calling, whence, in course of time, arose the designation of *son of Æsculapius*. The sacred edifice, appropriated to sanitary as well as religious uses, claims the merit of being the first hospital, receiving into its dormitories the victims of every disease, and affording them, in its spacious grounds, the advantages of salubrious air, refreshing fountains, and perfect tranquillity. Frequent immersion in the medicated springs connected with the building was no doubt a principal feature in the treatment, and, considering the general neglect of cleanliness in those distant times, must have been attended with the most beneficial results. Each patient, on quitting the temple, presented the chief priest with a record of the

various symptoms, sensations, and pathology of his complaint, with an account of the treatment he had undergone, and the daily progress of his cure, by which means a most valuable store of knowledge was accumulated in the professional archives, for the information and guidance of practitioners.

Pliny names the philosophic Acron as the first who reduced the practice of medicine to a science;[8] but we may believe that it owed something to the zealous labours of Pythagoras, who lived rather more than a century earlier, and, though he never practised as a physician, included the ills that flesh is hei to in his studies. At the same time, the very nature of the Pythagorean philosophy, ever diverging into fanciful speculations, must have blinded its venerable founder to the truths of physiology, which are broad, definite, and precise; and it is possible that Pythagoras imparted little real momentum to the infant science. Indeed, we may believe that he relied chiefly on the influence of the imagination, which he invoked by charms and incantations, and especially employed the agency of music.

Acron flourished about B.C. 450. He ge-

[8] Lib. xxv. 57.

nerally resided at Agrigentum, where he wrote several physical treatises in the Doric dialect; but, on the appearance of a great plague, he proceeded to Athens, and by lighting fires before the houses of the infected, arrested the pestilence. He was a contemporary of the first Hippocrates, who lived at Cos; but, like Acron, visited Athens, and rendered important medical services to that city.

For a considerable period, the healing art restricted its prescriptions to such simple remedies as ablution, purging, and bleeding, with a free use of gymnastic exercises, as auxiliary to the proper development of the frame, and occasional regulations of diet. But this practice was founded on no knowledge of the structure of the human body, nor any investigation of the conditions of vitality; but rather, as in the earliest ages, on the data furnished by the pathology of particular cases, as observed by individuals of different capacities, views, and opinions. These experiences, moreover, were clouded by metaphysical speculations, attributing certain effects to various imaginary causes, which had no existence in nature, and, consequently, entangled both patient and practitioner in a maze of per-

plexity, that usually had no outlet but the grave.

This pernicious system was much shaken by the discoveries of Hippocrates, who about B.C. 420 opened a new epoch in medical science. It is doubtful, however, how far he carried out his first intentions, which were to separate physiology from abstract philosophy, and ground it on facts, the only foundation on which it could be raised. It is true, he discarded the fallacies of Pythagoras; but, in their place, he devised an equally fanciful theory of his own, asserting that the body was composed of three ingredients—solids, fluids, and spirits, produced from different conditions of the four original elements, which, in their turn, were derived from fire. Fire was thus represented as the source both of life and matter, and its creative particles were said to be perpetually moving, whence, according to varying degrees of intensity, they successively threw off the other elements. He considered the human body to be affected by the stars, and to be immediately governed by a mysterious innate faculty, which presides over its functions, instinctively warning them against malignant, and attracting them to propitious influences. As a leading doctrine, he incul-

cated the principle that all diseases were generated in the fluids, which he divided into blood, bile, and black bile; and this hypothesis, universally accepted by physicians, remained uncontested for upwards of two thousand years, when the light of the eighteenth century exposed its fallacy.

Hippocrates was the author of some valuable works, but their exact number is unknown, and has been the subject of endless controversy. Some authorities rate them at fifty-eight, while Gromer, by whom the question was carefully investigated, limits the authenticated treatises to ten. They labour under the disadvantage of being written in a curt and obscure style, and are now chiefly known through the works of Galen, who is, as it were, the mirror of Hippocrates, reflecting all his opinions, and finally consolidating his system.

We may safely conclude that the knowledge possessed by Hippocrates, undoubtedly great in his own day, has, in its transit by tradition, been considerably magnified, since his existing works do not reveal the discoveries he is reputed to have made. His acquaintance with anatomy was very limited, and evidently founded on no study of the human

frame, though some of his admirers, anxious to place him on an elevated pedestal, contend that he was cognizant of the circulation of the blood, as described by Harvey. It is certain that he had never traced the vital fluid through the conduits of the body. In his treatise on fractures, he shows some familiarity with the structure of the skull, clearly derived from the dissection of inferior animals; but of the trunk, with its secret recesses of the heart and lungs, he can speak only in vague and confused terms. The heart he depicts as a pyramid, composed of muscles, branching into two ventricles, enclosing the founts of life; and two auricles, reservoirs of air. Air is also said to pass through the lungs, which are represented as consisting of five lobes, cellular in structure, and in substance resembling sponge. The brain is described as a gland; and the nervous chords, the electric wires that diffuse its intelligence through the system, are completely overlooked. It is thus manifest that Hippocrates could not have possessed the manifold acquirements with which he has been invested.

The Athenians ascribed to Hippocrates their delivery from a plague which then threatened to devastate the city, but he can-

didly confessed, in his public oration, that of forty-two patients confided to his care, only seventeen had recovered. He was, nevertheless, rewarded with a golden crown, the privileges of citizenship, and the initiation of the grand festivals. His prolonged life attested the success of his practice, extending to his 90th year, when he expired of pure old age, B.C. 361, in the full possession of his faculties, and without any symptom of bodily disease. Tradition still points out, in his native island, the hallowed spot where he lived; and humanity will ever regard him as one of its greatest benefactors.

The vacant chair of Hippocrates was inherited by his son-in-law Polybus, who, however, appears to have passed his life more in the closet than the hospital, and hence to have acquired but little experience. But in this seclusion he diligently studied the internal structure of the inferior animals, particularly those which were supposed to resemble that of the human frame; and his works, preserved through so many ages, comprise numerous anatomical sketches, illustrative of his physiological observations. He especially directed attention to the large blood-vessels, which he divides into four parts; but his conclusions

are generally erroneous, and, while founded only on analogy, become further obscured by doctrines borrowed from the fanciful speculations of Plato, and wholly foreign to the simple mechanism of nature.

But the time was approaching when all these delusions were to vanish; and the human form divine was to open its beautiful structure to the piercing eye of science. The year B.C. 384 gave birth to Aristotle, who, some thirty years later, extended his inquiries to every branch of learning, medicine and anatomy included; and, by his wondrous application, added rich acquisitions to each. To him we are indebted for the earliest exploration of the hitherto closed chambers of 'this temple of the body.' What thoughts must have filled the philosopher's mind as, secluded and alone, he first broke through its awful door of flesh! Had he been seen, mankind would have united to execrate the act, and drag him to an ignominious death. But midnight, with its solemn shadows, envelopes the city; all is solitude and silence; and only a taper's light falls on the corpse, extended in the Stagyrite's closet.

Imagination has pictured Frankenstein in

his chamber, moulding a crude mass of matter, which at length took a definite shape, bearing a hideous resemblance to the human frame. But though he had fashioned the carcass, it was without animation: the material mechanism, with all its intricate springs, was complete; but there was nothing to set it in motion. Suddenly the adept elicits a new essence, which he infuses into his fabric: the inert form begins to heave, to throb, to breathe, and the monster is a living being.

With different feelings Aristotle bent over his task, though, at first, they must have been of a character to impress and awe. His object, unlike that of the alchemist, was not to create, but to preserve—not to animate the dead, but to sustain the living. Still he might be considered as invading the functions of Jove, and was engaging in an investigation odious both to gods and men. And what problems might it not solve, what mysteries unravel! Perhaps, in unveiling the different organs, he might detect the principle of vitality, the subtle element that united matter and spirit, body and mind; and, in any case, his search could not but produce the most important results to his species.

If such was the height of his ambition, it

was fully attained; for his anatomical labours, carried on with unwearied assiduity, led to discoveries of infinite value. With the knife of science in his hand, he laid bare the heart of man, exposing its structure, its mechanism, and its functions. He at once demolished the figment of the primitive school, that the blood issued from the brain, and showed that it was welled in a cavity of the heart, whence it flowed, as from a spring, to every part of the body. He thus announced the principle of the diffusion, though he makes no mention of the circular motion of the vital stream; and he is very precise in his description of the blood-vessels as the channels of dispersion. Entering the dark retreat of the breast, where nature, as well as man, laid up her secrets, he scrutinised the fabric of the lungs, and traced out their connection with the windpipe, by which he discovered the beautiful system of inspiration and exhalation, which ventilates the body. Anatomy and medicine were now grounded on physiological knowledge, and, however they might diverge from their natural course, they could never again countenance the ideas of Pythagoras and Plato.

In the same age, and only a few years later, B.C. 320, Panaxagoras of Cos followed

Aristotle in his investigation of the blood-vessels, distinguishing the arteries from the veins, and characterising the former as conductors of air. Tracing the blood through its channels, he assigned a cause for the pulse, which imparted a momentum to the precious tide, while it marked the seconds on the dial of life. But half a century was to elapse before the great work commenced by the Stagyrite was to be fully accomplished. Ptolemy had then founded the school of Alexandria, and in that seminary, B.C. 270, rose two philosophers, Herophilus and Erosistratus, who may be regarded as the fathers of modern anatomy.

Many delusions had been framed respecting the brain, where man failed to detect the seat of his own soul; and its superior functions were unrecognised and unknown. Erosistratus, by his repeated dissections, proved the fallacy of previous notions, and elicited the truth. In this retreat he placed thought and will and impulse, acting in the different parts of the body by the nerves, which he discovered threading the labyrinth like clues, and for the first time classified, by a natural division, as nerves of sensation and motion. Herophilus operated with the same diligence

on the liver, but without ascertaining the full extent of its office. This, indeed, is hardly yet defined; and his description of the liver is at least accurate, and had the honour of being quoted by Galen for the guidance of future ages.

Under the republican form of government, Rome added nothing to medical science, though from the writings of Cicero it is clear that the Roman faculty were not unacquainted with the structure of the body.[9] In their treatment, they appealed largely to the imagination, and, perhaps, were not above the use of charms, but such devices, arising only from a want of skill, gradually disappeared, as the Alexandrian school introduced a purer system. The herald of the new principles was Celsus, who flourished in the first century of the Christian era. He was succeeded by Galen, whose professional dicta grew into laws, and are still, after the lapse of eighteen centuries, deemed little less than oracular.

This great physician was born at Pergamos, a town of small importance, but highly favoured by learning; and was the son of an architect, by whom he was sent, at a proper

[9] 'De Natura Deorum.'

age, to Egypt, where he attended the school of Alexandria. Here he early developed the grasp of his intellect, successively attaching himself to the various sects of philosophers, without adopting the system of any; and in his eighteenth year, he commenced the study of medicine. But notwithstanding his successful cultivation of the science — notwithstanding the extraordinary eminence he attained, and the real value of many of his conclusions, it does not appear that he was practically acquainted with the structure of the human frame; and his anatomical descriptions are drawn chiefly from the bodies of inferior animals, analogically extended to this fabric. Their application, indeed, is so precise, that it is difficult to regard them as imaginary; and, considering the narrow limits of his experience, they almost amount to inspiration. Doubtless his celebrated treatise, *On the Use of Parts*, owed much to a diligent study of the works of Hippocrates; and, in fact, it is enriched with physiological descriptions from that author, which, but for their being thus embalmed, would have been lost to posterity. But it is admitted that it displays also great originality of thought, a remarkable force of reasoning, and

a singular perception of the form, as well as the functions of our different organs; and, with all its imperfections, it is the noblest physiological relic of antiquity. Nor can we be surprised that it should cling to some of the errors, while it elaborated the discoveries of Hippocrates, and blended the wisdom of the new school with a few delusions of the old. Such a result only shows how deeply rooted were the ancient fallacies, since even the disciplined intellect of Galen was unable to shake them off.

Galen retained the primitive dogma that the human body is composed of four elements, and endued with four qualities; and, like his great exemplar, placed the source of disease in the fluids. To these he gave the name of humours, an appellation which, as time rolled on, was applied to the theory, and this remained predominant for fifteen hundred years.

In his own day, the opinions of the great physician, though exercising a paramount influence, did not pass undisputed; but all opponents were overborne by the effusions of his pen, which possessed no less potency than his prescriptions. No amount of argument, indeed, could counteract the effect produced by his cures, which were so numerous and re-

markable, that his enemies ascribed them to enchantment, and, perhaps, resorted more freely to incantations themselves, in the hope of matching his skill. Succeeding generations held him in juster estimation; and his works, said to have been two hundred in number, were treasured in the Temple of Peace, where, after his death, they were destroyed by a great conflagration, leaving only a few scattered treatises, like Sibylline fragments, for the eye of modern inquiry.

On the demise of the Emperor Marcus Aurelius, Galen retired from Rome to his native town of Pergamos; and here, A.D. 192, when at the advanced age of ninety years, he closed his useful life.

Medicine could hardly have attained any degree of efficacy, without the aid of chemistry, which may be regarded as a sister science. Strange to say, however, there is no mention of it in the writings of antiquity; and even its name does not appear till the eleventh century of our era, when Suidas, an author of the Lower Empire, applies the term to what he designates the art of making gold, afterwards known as alchemy. To alchemy we doubtless owe many of its discoveries. Stimulated by avarice, man passed

his days in the laboratory, pursuing experiments which were indeed fruitless of gold, but yielded secrets far more precious. But this episode in the history of science is of comparatively modern date. Chemistry, it is true, was developed by alchemy, but, in its rudimentary state, it must have existed in primeval times. Alchemy was its nursery, but not its cradle, and Suidas is probably right in ascribing its origin to Thoth, who bequeathed to the human intellect so many of its acquirements.

But we have arrived at a period of medical knowledge which marks a boundary in its annals. From the era of moral darkness, when the slightest disturbance of the bodily functions occasioned misgiving and alarm—through long centuries of delusion, superstition, and ignorant empiricism, down to the happier age of Æsculapius, itself lost in the shadows of fable, what a tide of agonies must have swept over mankind!

The genius of Hippocrates, aided by his application and diligence, brought some further alleviations to human suffering, but still its cup of anguish was full. Then came Aristotle, who burst the cerements of tradition and sought for the secret of health in the

empty breasts of the dead. Now, indeed, a new epoch seemed to open, a new beacon to be kindled; but the light expired as it rose. Again there was darkness — nothing but darkness! The mind, without a monitor or guide, groped about, not knowing whither to turn; and yielded first to one hallucination, and then to another, each carrying it away from the true path. The school of Alexandria established a more rational practice—for as yet it could scarcely be called a system. Certain rules, indeed, were laid down, and certain principles were enunciated, but, these admitted, every practitioner did that which was right in his own eyes. Not till the advent of Galen did the science take form and vitality. His robust intellect, delivering it from ancient fallacies, imparted to it his own vigour, allowed it to develop its natural stature, and gave it that direction and impetus, by which it is still sustained.

Medicine is in modern times indissolubly linked with Chemistry, the purveyor of its pharmacopœia, and fruitful source of its remedies. But antiquity, as we have seen, knew none of those mighty secrets, which now render Chemistry the most potent, if not the most interesting of the sciences. There were

then no laboratories, no alembics, no crucibles. All was crude and rough, as furnished by the hand of nature; and medicaments were taken, herbal, mineral, or fluid, as they could be found. Still drugs were known from the earliest time, and, where procurable, were extensively applied. The practice of embalment must have familiarised the Egyptian physicians with the properties of certain drugs, and led them to further researches. We know that, by their chemical art, they imparted durability, not only to the fragile tissues of the human frame, but also to the shroud in which they were enveloped, so that, after an interval of four thousand years, it still exists. The frequent reference in the Scriptures to incense, precious ointment, and spices, to myrrh, frankincense, and balm of Gilead, from the time of Moses downwards, indicates some knowledge of chemical preparations among the Jews; and, in the Roman era, we find that the compounders of the famous love philters were usually Jewesses. Those noxious draughts comprised the most singular ingredients, such as an infusion from the forehead of a foal,[9] with deleterious drugs and spices; and were

[10] Plin. viii.

always prepared with magical incantations, directed at the person to whom the philter was to be administered. The Romans appear to have been only too skilled in the art of Borgia; and Juvenal draws a terrible picture of the prevalence of poisoning in the imperial city, admonishing wives to beware of their husbands, and opulent parents of their children.[11] Poisoning, indeed, was widely practised at an earlier date, under the republic; and Livy records the execution of nearly two hundred Roman matrons, who, during the consulates of Marcellus and Valerius, were convicted of this fearful crime.[12] But whatever knowledge was acquired of certain drug and minerals, the medicinal riches of nature were unsuspected, even by the most erudite practitioners; and, as already remarked, it was reserved for the alchemists of the middle ages, while pursuing their own delusion, to eliminate the principles of Chemistry, and give them the form of a science.

[11] Juv. Sat. [12] Liv. xxv.

V.

THE FINE ARTS.

We have arrived at a point in man's social progress when it becomes necessary to inquire what was his acquaintance with the fine arts, to which society owes so much, and civilization everything. The arts in their operation not only embellish life, but they, at the same time, elevate the faculties and ennoble the affections. They present to the eye the most beautiful conceptions of the imagination, in a chaste, eloquent, and symmetrical form. If science is the light of the mind, the arts may be called its atmosphere, since it is from them it receives expansion, elasticity, and inspiration. Under their magic hand, the crude marble is moulded into exquisite figures, swelling with emotion and life; animation and action are imparted to the painter's canvas; and the architect, by his skill and cunning, rears a fabric that embodies alike the luxuriant suggestions of the fancy and the practical laws of mechanics.

Architecture is the parent of the arts, as Astronomy is of the sciences. It first raised the imagination from the dust to the beautiful and sublime, to ideas of grandeur, elegance, grace, and symmetry, forming the taste and maturing the power by manifold but rapid gradations, which imperceptibly merged in each other. What a gulf divides the later epoch from the first! Standing in the midst of the Louvre, let us look back to the time when man grovelled on the surface of the earth, in habits, as in instincts, but little removed from the worm; and we shall then appreciate the miraculous transformation accomplished by the arts. And in this result architecture has borne a mighty part. We see the Indian in his wigwam, and wonder that humanity can tolerate the discomfort, the hardship, and the inclement exposure of such an abode. But in its capacity as in its structure, and still more in appearance, the wigwam is a material improvement on the original dwellings of man. In the remotest times nature was indeed untutored—naked and helpless in proportion as she was benighted, and without moral attributes or aspirations. Job has left us a terrible picture of the Troglodytes, who dwelt 'in the caves of the

earth and in the rocks: Among the bushes they are born; under the nettles they were gathered together: they are viler than the earth.' But in comparison with primeval savages, the Troglodytes had made some approaches to civilization. The earlier races had no permanent or settled dwellings. The skin of the animal slaughtered in the morning for food, and yet reeking with clotted gore, served at night as a tent to shelter the wearied huntsman from the dews of heaven. Gradually hides would accumulate; the tent would be enlarged; and, in fact, these dwellings of skins, subjected to no preparatory process, are still found among the nomade tribes of the East, perpetuating one of the first types of primeval architecture.[1] The next step was to take advantage of natural fissures in rocks, or to excavate artificial caverns in the sides of hills. Such was the residence of Lot, after the destruction of the cities of the plain, when, flying to the mountains, 'he dwelt in a cave, he and his daughters.' Soon boughs of trees, meeting overhead, suggested the erection of wooden pillars, roofed with umbrageous branches, which afforded a refuge from the sun by day, and from the humid atmosphere at

[1] Macintosh's 'Military Tour.'

night; and hence the transition was easy to the log-hut, the wigwam, the hovel, and the house.

Caves, from being the dwellings of the living, were converted into abodes for the dead. Conjecture can hardly suggest a date when the new usage was established, but it must have been at a very early era, since we find that it was a common practice in the time of Abraham, about B.C. 1900. The patriarch, seeking a burial-place for Sarah, engaged in a conference on the subject with the children of Heth, whose reply was—'Hear us, my lord: thou art a mighty prince among us: in the choice of our sepulchres bury thy dead; none of us shall withhold from thee his sepulchre.'[2] The answer of Abraham indicates what was the character of the sepulchres in use—'If it be your mind that I should bury my dead out of my sight, hear me, and entreat for me to Ephron, the son of Zohar, that he may give me the cave of Machpelah, which is in the end of his field.'[3] The custom of burying in caves continued in the East for many centuries; and, according to St. Mark, the body of our blessed Lord, after its removal from the Cross, was interred 'in a sepulchre which was

[2] Gen. xxiii. 6. [3] Gen. xxiii. 8.

hewn out of a rock.'[4] It was the same usage that in Egypt led to the erection of the pyramids, except that, in those vast structures, generations, rather than individuals, found a tomb.

But caves were not appropriated exclusively to man, either as a residence or a grave. They were early seized by the priests, the chief depositories of power, for the service of religion, and from this period we may trace the first feeble rise of architecture. The excavated temples of India, Persia, and Egypt, all bear a kindred character, suggesting the same conclusion as to their origin. The most ancient of those on the banks of the Nile, in Upper Egypt, is considered by Champollion to have been constructed about the time of Abraham; and as none has been discovered elsewhere of an earlier date, this fixes the epoch of their origin. The caves of Elephanta differ little from the rock temples of Egypt. In both, the interior is dark and grim, with nothing to attract the eye but rudely-formed colossal idols, hewn on the naked rock, and which heighten, rather than break the gloom. The larger excavations present a sort of pier, abutting from the side, as a support to the

[4] Mark xv. 46.

mountain roof; and here we discover the embryo of the column. Another series, indeed, show piers outside—the column itself—forming a sculptured portico on the face of the rock. Architecture had now begun to exist, and had developed its elements.

In countries where the absence of mountains, or their peculiar formation, precluded cavernous structures, the devotional feeling of man exhibited itself in a more simple type of architecture, which, however, led to results equally signal. Stonehenge still presents to us the structure and semblance of the earliest terrestrial temple raised by man. It illustrates, in forms rude but distinct, all the outlines of architectural art. The upright stones represent the columns; the sacrificial block suggests the pedestal; and the vast overarching sky furnishes a dome. As no similar relics have been found in the East, it might be supposed that they had never existed there, but we have Scriptural testimony that columnar fabrics, which must have been of a kindred character, were erected in the land of Canaan, and their complete disappearance is accounted for by Moses, who, speaking of the divine judgments on that region, says God 'shall overthrow their altars and break their

pillars.'[5] The sacrificial stone, indeed, is mentioned at a much earlier date. Jacob erected one after his memorable dream, on his way to Padan-aram, when, we are told, he 'rose up early in the morning, and took the stone that he had put for his pillows, and set it up for a pillar, and poured oil on the top of it,'[6] B.C. 1760. Pillars were in use more than a century before, when Lot's wife is said to have been changed into a pillar of salt;[7] and it is remarkable that, according to the calculation of Champollion, this was about the date of the most ancient columns of Egypt—a singular testimony to the accuracy of Holy Writ, which has here, to all appearance, incidentally alluded to columns at the precise epoch of their introduction.

But, in all these efforts, architecture, though marking out great principles, is scarcely brought to light. We see her as in a glass darkly—as a shadow—rather, perhaps, as a statue, throwing up its outlines, but having its form masked by a shroud. Man had not yet begun to build—using the term in its broad sense; for the so-called cities were, even at a much later period, nothing more than aggregations of hovels, surrounded by a

[5] Deut. xii. 3. [6] Gen. xxviii. 18. [7] Gen. xix. 30.

fence and ditch. The first builders seem to have kept in view one grand and paramount principle: this was durability; and so well did they carry out their design, that fragments of their walls remain to the present day, as monuments of their success.

These primeval ruins, more ancient than the pyramids of Egypt, more ancient than the stones of Nineveh, are found chiefly in the East of Europe, in Greece, Turkey, and Bulgaria; and from their evident priority to historic, and even traditional times, have received the name of Cyclopean, placing their origin in the ages of fable. It is generally supposed, however, that they were erected by the Pelæsgi, who, according to Heeren,[8] were a colony of the Phœnicians; but, considering that remains are found in localities widely apart, it appears not unreasonable to conclude that they were the work of different races, and may, in fact, be regarded as a type of building universally prevalent at a particular epoch. Their date may probably be fixed at about 1720 B.C., which would be the era of Joseph; and, remote as that period may seem, forty centuries have made little impression on these mighty fabrics. Rugged

[8] 'Manual of Ancient History,' 119.

blocks of rock, wrenched from the mountain side by giant hands, compose their courses, the interstices being closed by fragments, which, without mortar, hold together by their own weight, forming a wall of adamantine strength and compactness. Such were the works of patriarchal architects!

Coeval with the erection of the Cyclopean structures, cities began to assume proportions which must have had an effect on architectural taste. The *Mahabbarit*, an ancient Hindoo poem, assigns a remoter origin to Oude, the first capital of India; but there is no trace of its existence beyond the time of Isaac. It continued to be the seat of government for eight centuries, when, about B.C. 1000, the era of Solomon, it was eclipsed by Canouge, described by Strabo as seated on the banks of the Ganges,[9] surrounded by fortifications of wood, still widely adopted in India.

The foundation of Babylon is placed at B.C. 2247; but the honour of rebuilding this famous city, as it is described by the ancient historians, is awarded to Semiramis, whose reign cannot be assigned an earlier date than B.C. 1900, which would make her a contem-

[9] Geog. xv.

porary of Abraham. Babylon was visited by Herodotus, who affirms that 'it was adorned in a manner surpassing any city we are acquainted with;'[10] and, in the same chapter, depicts its leading features with characteristic minuteness. From this account, it would appear that the buildings within the walls covered a circumference of sixty miles, bisected by the Euphrates, which, flowing in the midst, divided the monster town into two nearly equal parts. The cross streets, twenty-five in number, had an uniform breadth of 150 feet, and were composed of houses three or four stories high, with sufficient intervening space to allow of a chariot being turned between each building. Round the inside of the walls ran other streets, with an uniform breadth of 200 feet, and formed of structures corresponding in dimensions with the rest of the city. Three walls, one within the other, surrounded the whole, and afforded access to the country through gates of brass, flanked by towers of extraordinary height and solidity.

In the interior of the city rose a colossal tower, of which both Strabo and Herodotus have left us a description, but that of the

[10] Lib. i. 178.

father of history,[11] founded on personal observation, is the more exact. This stupendous building was composed of eight stories, rising one over the other to the altitude of a mile; and was encircled by flights of steps running spirally round the successive towers to the summit. The uppermost story presented a spacious temple, emblazoned with gold; and in a recess was a sumptuous couch dedicated to Jupiter. At night, the temple was confided to the charge of a woman, the only mortal ever permitted to remain in its sacred precincts; and at this dizzy height, divided by clouds from the dwellings of men, the vestal was in attendance to receive the god if he should visit the earth.

The Euphrates was adorned on both its banks by stately palaces, alleged to have been erected by Semiramis; and one of which was three miles in length, while the other attained the incredible magnitude of eight miles. The two buildings were connected by a drawbridge, thrown over the river, and a tunnel afforded a secret communication beneath its waves. Canals, flanked by trees, forming the far-famed 'waters of Babylon,' and its 'gardens of willows,' so pathetically asso-

[11] Lib. i. 181.

ciated with the daughters of Zion, conducted the waters of the Euphrates through every part of the city; and the wooded banks were interspersed with villas and pavilions, the residences of nobles and wealthy citizens. One of the pavilions was disinterred by Layard,[12] and is the only columnar relic discovered at Babylon.

Babylon has been thought by some to have been posterior in origin to Nineveh, but it is more likely that the date was coeval, since Asshur, mentioned by Moses as the founder of Nineveh, is considered to be the same as Nimrod, the builder of Babylon. The two cities appear to have differed little in magnitude, as Jonah describes Nineveh as 'an exceeding great city of three days' journey,' which, reckoning by the Jewish standard, gives a circumference of sixty miles, the exact dimensions of Babylon. Nineveh was surrounded by walls one hundred feet high, and of proportionate breadth, so that, according to Diodorus Siculus, three chariots could be driven abreast on their summit.

The researches of Layard have brought to light some splendid relics of Assyrian architecture, showing that the Chaldean builders

[12] 'Researches at Nineveh and Babylon.'

emulated the Hindoos and Egyptians in their cultivation of the art; but though their monuments display considerable taste, and take a first rank for solidity and magnitude, they are not distinguished by the grace and elegance that characterize the temples of the Nile. The houses of both Nineveh and Babylon were built of sunburnt brick, the effect of which could hardly have been pleasing; but, within, they presented a handsome appearance, the lofty interiors, after receiving a coat of plaster, being panneled with alabaster, or decorated with paintings, while varied and elaborate sculptures adorned the walls of the palaces and temples, to which light was admitted from the roof. Mr. Layard considers that the ordinary dwelling-houses were furnished with windows, a conjecture which—though it seems to have escaped his notice—is borne out by a passage in Daniel, where we are told that the prophet's '*window being open* in his chamber towards Jerusalem, he kneeled upon his knees three times a day and prayed.'[13] But these windows must have been mere apertures, fitted with shutters or blinds; for though the Assyrians were acquainted with glass, they

[13] Dan. vi. 10.

appear, like the rest of the ancients, not to have been cognisant of its beautiful quality of transmitting light, never applying it to that purpose.

It is doubtful whether architecture had its origin either in Nineveh or Babylon; and, indeed, the honour of its parentage has been claimed equally by India, Persia, and Egypt. China has never made any progress in the art, and even at the present day her buildings are without its pale. But the ruins of ancient India, the still stately remains of Persepolis, and the temples and palaces of olden Egypt, monuments of her primeval greatness, may, for elevated taste, symmetry, and solidity, serve posterity as models. Yet, perhaps, it is between Egypt and India that the priority mainly lies; for the columns of Persepolis are posterior to the conquests of Cambyses, and therefore cannot cope in antiquity with the stones of Egypt. Whether the cradle of architecture or not, Egypt is still a museum of the ancient art, preserving its most splendid remains. Possessing no forests, and, consequently, being destitute of timber, she was from the first driven for building materials to her spreading mountains, which were embowelled with granite, porphyry, and

marble; and with such substances, acted upon by mechanical appliances of inconceivable force, and prodigious manual labour, she aimed to erect structures of lasting stability and excellence.

Speculation has long been at a loss to discover what could have originated the shape of these stupendous edifices; but one possible derivation may have been overlooked, and there is some ground for thinking that they may represent a religious idea—no other, indeed, than the awful mystery of the Trinity in Unity. It is strange that the pyramid should have been erected simultaneously in Egypt and India, and, more singular still, was found by the Spaniards in Mexico and Peru. This tends to show that it was a memorial of some idea widely diffused among mankind. Nor is the purpose to which it was ostensibly appropriated in India as well as Egypt, inconsistent with a religious origin. Within its massive walls reposed the dead, as if in the faith of the tenet it symbolised, and by which, having been once created, they hoped to live again. It may be thought that this is straining conjecture beyond reasonable limits; but to those who ignore religious meanings in the Egyptian monuments, in what way shall

we account for the appearance of the Cross. Yet one of the oldest temples of Upper Egypt is built on the plan of a perfect cross; and the city of Benares, in India, boasts a pagoda of the same form, having in its centre a cupola, surmounted by a pyramid, thus associating the two symbols in the same religious edifice.

The greatest of the Egyptian pyramids is that of Cheops, at Gizeh, on the banks of the Nile, and it may, at the same time, be pronounced the most ancient. Rising, according to Sir Gardner Wilkinson,[14] from a base of 755 feet in length, on each face—which is considerably short of the measurement of Herodotus—it attains a height of 500 feet. The undertaking, including the construction of a road for the more easy transport of materials, occupied 100,000 men for a period of thirty years;[15] and the cost entailed great misery on the whole nation. From an inscription on the base of the pyramid, it appears that the mere expense of providing radishes, garlic, and onions for the workmen, amounted, from first to last, to no less a sum than sixteen hundred talents of silver.[16] The structure is of stone; the courses, which vary

[14] 'Ancient Egyptians,' ii. 256. [15] Herod. ii. 124.
[16] Herod. ii. 125.

in thickness from two to three feet, recede as they ascend, in regular gradation, and form a flight of steps to the summit. The entire fabric is a solid mass—only pierced by a gallery, leading to a small cavity, immediately over which, in the centre of the pyramid, is a chamber, enclosing a sarcophagus, tenanted by a single body. Thus this architectural Alp is but a tyrant's tombstone, and his corpse, the bad heart of a granite breast, may remind us of the toad sometimes discovered in a mass of rock, a sepulchre transcending the Egyptian King's.

Nevertheless, it must not be supposed that the works of antiquity were all of this barren character, sacrificing a whole generation to the caprice of an individual. Here, indeed, we behold a race of slaves working out the purpose of a single will—the human mind perverted and in chains; but, as before remarked, subjection to arbitrary power was, at this period of the world, favourable to the development of the latent faculties. A single example of abused authority is no set-off against many works of great and general utility—roads, canals, temples, fortifications, even other pyramids, which served, in a country where soil was precious, as cemeteries for the nation. The human intellect was now

in its childhood, learning its first lessons from the taskmaster; and, perhaps, this training was a necessary preparation for that perfect liberty, which alone produces true genius.

The temple of Amada, built on the banks of the Nile by Moeris, and referred to the era of Jacob, is considered to be the original type of the Doric order of architecture. Twelve pillars supported the roof, and four columns, massive and naked without being heavy, imparted an air of grandeur to the structure. But the Egyptian priests were soon capable of erecting works of a more elaborate and magnificent character. The aid which architecture could be made to render to religion being recognised, it was used to give colouring and sublimity to its services. But, like the other arts and sciences, it was regarded as a key of knowledge, only to be entrusted to a priest; its practice was therefore vested exclusively in a sacerdotal college; and certain arbitrary principles were established, from which, as time advanced, no deviation was permitted. Hence the natural genius of the priests was fettered; they could not divest their works of a certain degree of sameness; and we wonder the more that they produced such architectural miracles as Karnac and Luxor.

These two vast fabrics are both situated at Thebes, on the eastern bank of the Nile; and are not more remarkable for their magnitude than their splendour, which, in the midst of desolation and ruin, is still conspicuous. Around rise forests of columns, imposing by their height and girth, at the same time that, from the symmetry of their form and delicacy of finish, they maintain a graceful lightness. At Karnac we first meet the arch,[17] terminating an avenue of colossal sphinxes, and affording an appropriate entrance to the interior. Arrived at the great hall, new ranges of columns meet the eye, opening vistas at every point, and huge blocks above form a Cyclopean roof, which, here and there, preserves the tints of its once gorgeous blazonry.

Of the cities of ancient Egypt, the two greatest were Memphis and Thebes, the former, by the concurrent testimony of historians, claiming the priority in antiquity, and the latter in splendour. Diodorus Siculus[18] places the foundation of Thebes in the reign of Busiris, but it is generally supposed to have been built by Sesostris, and certainly it owed to that monarch its greatest edifices. In the

[17] Melly's 'Khartoum,' i. 176.

[18] Lib. i. 4.

height of its renown, it boasted a hundred gates; and the authority just quoted, describing its principal features, affirms that the private dwellings belonging to the nobles and citizens generally ranged about five stories in height. But Sir Gardner Wilkinson observes that 'though Diodorus speaks of the lofty houses in Thebes four and five stories high, the paintings show that few had three, and the largest seldom four, including, as he does, the basement story.'[19] It is thought, indeed, that the family chiefly resided on the first floor, from one side of which rose an additional story, sometimes in the form of a tower; and this, in most cases, opened on the roof of the other portion, which presented a sort of terrace, surrounded by light elegant columns, sustaining a roof or awning. In the ground plan, chambers were constructed round three sides of a court, where trees, planted in order, afforded a grateful shelter from the noonday sun.[20]

It may seem unaccountable that the Hebrews, who passed nearly three centuries in Egypt, in the presence of such impressive and magnificent structures, carried away with them no taste for architecture; but it should be

[19] 'Ancient Egyptians,' i. 8. [20] Ibid.

borne in mind that they were essentially a pastoral race, and that the task imposed upon them in connexion with these works, was not of a character to inspire a passion for building. For several centuries the Ark of God was kept in a tabernacle, and David takes shame to himself that he dwells in '*a house of cedar*,' while this emblem of the divine covenant is exposed in a tent. Architecture, indeed, was so little understood by the Hebrews, that Solomon was obliged to apply to Huram, King of Tyre, for a competent architect, to direct the construction of the Temple; and we are informed that the Tyrian monarch sent him 'a cunning man, endued with understanding, of Huram, his father's, the son of a woman of the daughters of Dan, and his father was a man of Tyre, skilful to work in gold and in silver, in brass, in iron, in stone, and in timber, in purple, in blue, and in fine linen, and in crimson; also to grave any manner of graving, and to find out every device which shall be put to him.'[21] Very erroneous impressions have been formed of the character of the Temple, viewed as a work of art; and the eulogistic expressions of the Scriptures have usually been interpreted

[21] 2 Chron. ii. 14.

in this sense, instead of being applied, as is obviously intended, to the splendour and magnificence of the fabric. In point of decoration, and the costly materials used with such prodigality, it may indeed be considered as standing unrivalled; but the Scriptural descriptions do not give the same idea of its architectural superiority. On the contrary, we are led to conclude that its embellishments, while calculated to impress the Oriental imagination, were too elaborate, and too gorgeous, to satisfy a correct taste; and marred by barbaric pomp the simplicity of its Egyptian outlines. That the general style was Egyptian, we may safely believe, not only from the circumstance of the architect coming from Tyre, originally a colony of Egypt, but from several details of the structure, and especially from the situation of the pillars of Jachin and Boaz, which were assigned the same place in the porch of the temple, as was occupied by two obelisks at Karnac and Luxor.[22]

Whatever architecture may owe to the nations of the East—to the Hindoo palaces of marble and jasper, the granite monuments of

[22] 1 Kings vii. 21.

Nineveh, or the clustering columns of Persepolis—and whatever development it attained in the temples and cities of Egypt, it is to Greece we are to look for its most exquisite conceptions, combining all the requisites of symmetry, elegance, and grace. The taste of Pericles sought to adorn Athens with every witchery of art, and the dexterity of Phidias and Callimachus fully carried out his wishes. The beautiful fabrics of that city, after being despoiled by conquerors, desecrated by barbarians, and almost crumbled by age, are still recognised as the highest achievements of human skill, studies for all time and every nation. Here beauty shows its most perfect outlines, symmetry its fairest proportions, masonry and sculpture their most delicate stone-work. Art exhausted her cunning, and genius her devices, to diversify and embellish these majestic piles; and, in their splendid fragments, we recognise the *Iliad* of architecture, from which, while they endure, instruction must be sought by latest ages.

Corinth furnishes, in a ruined temple, plain and simple in character, the earliest extant specimens of the columnar fabrics of Greece,

forming a beautiful example of the Doric order. This was obviously the first perfect type which the column assumed, since we find it, in a rudimentary form, at the temple of Amada, the most ancient of the Egyptian edifices; and it would seem to have been suggested by the stems of trees, in which nature presented its model. It soon gave birth to the Ionic order, originated in Ionia, whence it derived its name. The new column, raised in height and diminished in diameter, received the addition of a base, and was crowned by a more elegant capital, adorned with a volute or scroll, while the entablature, the horizontal mass superimposed on the tablet of the column, was made to comprise three parts,—the architrave, frieze, and cornice. The whole is remarkable for the faultless harmony of its proportions, distinguished by a grace almost feminine; and, indeed, the volute surmounting the column is said to have been derived from the luxuriant tresses which waved over the foreheads of the Greek women.

The Corinthian order is another illustration of the rich fancy and skill of the Greeks. Tradition assigns it an origin as poetic as its lineaments; and it was at the

grave of a young girl of Corinth, cut off in the flower of her life and beauty, that Callimachus, its designer, is reported to have caught the inspiration. On this spot some fond hand had placed the trinkets of the departed maiden, as a last tribute of affection; the basket containing them rested on an acanthus, which, as it shot up, twined about the twigs, and, with its stalks and leaves, formed slender volutes round a square tile, lying on the top of the basket. Let us give credence to a story which imparts additional interest to a design so exquisite, investing the most delicate achievement of architecture with the fascination of romance.

The Corinthian order is called the foliate, as the Ionic is the voluted style, and takes its name, as does the Ionic, from the character of its capital. Like the Doric, they consist of a stylobate, or pedestal, a column and an entablature; and, in addition, possess a base, and a decorated capital. But with so much scope for embellishment, and so much to relieve and lighten the column, it may be doubted whether their effect is really so imposing as that of the Doric, which, though unadorned, preserves a noble grandeur in its precision and simplicity.

The Corinthian order was extensively adopted by the Romans, whose stupendous works, allowing for the previous lapse of time, approach those of Egypt in duration, and of Greece in beauty. But Rome laboured under the disadvantage of entering at once the highest sphere of art, without undergoing a previous training; consequently, her fabrics, though great and magnificent, are rather the spoils of other nations than creations of her own. The genius of the primitive Romans was exclusively military; and it was not till about a century before the accession of Cæsar, that the great generals of the republic, returning from distant conquests, and entering the city in triumph, brought the captive arts in their train. At their bidding, and often at their cost, structures similar to those they had observed in foreign countries were erected at Rome; the places of public resort were adorned by statues; and so vast were the embellishments introduced by Augustus, that he was accustomed to boast that he had found his capital of brick, and should leave it of marble.[23]

But from the circumstance of their being accidentally endowed with the wealth of

[23] Gibbon, i. 59.

antiquity, and not reared in the initiatory principles of art, the Romans rarely attained the native purity of style observable in the Greek fabrics. In their hands, the Corinthian column changed its proportions, and the stylobate was raised, and usually not graduated. Too many of their edifices, violating that simplicity which is the first element of architectural beauty, consist of the Composite style, so called from embracing the characteristics of all the other orders, in one integral composition. Such an arrangement could not but lead to some extravagances in detail, and, accordingly, we find columns coupled together, entablatures cramped and recessed, and pedestals deformed, marring the symmetry of the parts, and, as a consequence, diminishing the general effect.

Perhaps the most splendid relic of Roman architecture is the amphitheatre of Vespasian, called from its magnitude the Colosseum; and which covers an area of 570 feet in length by 470 in breadth. This vast building was capable of accommodating 100,000 spectators. But here, amidst much to admire, we discover all the faults of Roman art; and while admitting the grand effect of the whole,

are quickly struck by the defects of parts. The stylobates are recessed; the columns are intermingled; and their height, as far as it affects the eye, diminished by wide arches, which encumber rather than lighten the pile.

The arch was used by the Romans with great freedom, and usually with admirable taste. We have seen that it was also adopted by the Egyptians,[24] and there is evidence that it was known to the Greeks. But the classic architects of Athens, so brilliant in their conceptions and combinations, appear to have overlooked the susceptibilities of this auxiliary, and it found no place in their embellishments. Its presence imparts both lightness and elegance to the later fabrics of Rome, which are less perfect in design, and coarser in execution. The Romans were also the first to introduce the arch in viaducts and bridges. Bridges, indeed, had existed in countries traversed by rivers, from the earliest ages; and instinct would naturally teach men, even in a savage state, to find some means of crossing unfordable streams, without personal risk. The tree prostrated over a narrow channel, the plank laid from bank to bank,

[24] See p. 220, ante.

the basket swung from one crag to another, would gradually be succeeded by a more stable edifice, designed for permanent use. Such was the great bridge of the Euphrates, connecting the two cities of Babylon. But, in remote ages, none of the Eastern nations were acquainted with the arch, and, consequently, the bridges of Asia were mere causeways, with a centre moveable for the passage of ships. Temporary bridges were constructed over great rivers by armies on the march, and that thrown over, or, rather, raised on the Hellespont, by the legions of Xerxes, will readily occur to the student. The form of the arch appears to have been early known to the Chinese; but they were unacquainted with the important secret of maintaining equilibrium, by the settlement and mutual dependence of its parts; and the upper segment of the Chinese arch is still carved whole in wood, and secured by bolts in the adjacent masonry, presenting one of those clumsy contrivances in which that people display at once their barbarism and their ingenuity.

The Tiber, at Rome, was spanned by several bridges, representing the different characteristics of Roman architecture, and

adding to the embellishment of the city. The triumphal bridge was appropriated to the public entry of heroes, to whom the Senate had decreed a triumph. Another was Pons Ælius, built by the Emperor Adrian, which supported a roof of bronze on forty-two stately columns. But the Tiber, from its limited width, afforded small scope for display, and works of this character were more frequent in the provinces. The bridge of Alcantura attests the scale on which they were constructed, and its six arches, upwards of 200 feet in height, still span the broad channel of the Tagus, preserving to posterity a Roman road.

It is thus clear that the magnificent works of the Romans were not confined to the capital, and, on the other hand, we know that they were not built exclusively at the public expense. Distant provinces, as well in Asia as Europe, were adorned with similar edifices, erected by patriotic governors, or at the cost of wealthy citizens. Herodes Atticus offers a memorable example of this kind of munificence. Having found an immense treasure, he complied with the injunction of the law by presenting it to the Emperor Nerva; but that illustrious prince, great in

all his actions, generously declined the gift, and authorised its retention by the discoverer. Atticus replied that the treasure was too great for a subject to use. *Abuse it, then,* was the answer of the Emperor; and, with this licence, Atticus expended vast sums in the embellishment of his native city, which soon boasted fabrics worthy of Rome itself.

It is not easy to trace the decline of architecture under the Roman sway; but it kept pace with the political decay of the empire. Constantine selected a matchless site for a new city, which should deserve to become the capital of the world; he was possessed of boundless power, unlimited resources, and a command of manual labour surpassing that of the Pharaohs. But, says Gibbon, he 'soon discovered, that in the decline of the arts, the skill, as well as numbers of his architects, bore a very unequal proportion to the greatness of his designs. . . . The buildings of the new city were erected by such architects as the reign of Constantine could afford, but they were decorated by the hands of the most celebrated masters of the age of Pericles and Alexander. To revive the genius of Phidias and Lysippus surpassed, indeed, the power of a Roman

emperor; but the immortal productions which they had bequeathed to posterity, were exposed without defence to the rapacious vanity of a despot. By his command the cities of Greece and Asia were despoiled of their most valuable ornaments.'[25] And it was with these memorials of a brighter era that Constantine decorated the Golden Horn.

Amidst such buildings, surrounded by what may be called the ruins of art, architecture could hardly expire, and, though it never wholly recovered, it contrived to maintain a lingering existence. Eastern taste exhibited itself in the style designated Byzantine, which blended the simple elegance of the classic school with barbaric decoration; and, as the order was more developed, its light, graceful columns, its elaborate tracery, and its fantastic proportions, composed a most picturesque combination. The style has many admirers; but, perhaps, it is a certain indication of its false taste that, while all the other orders are still universal, the Byzantine has become obsolete, and we are content to applaud, without seeking to imitate, the fabrics of the Bosphorus and Adriatic.

[25] 'Decline and Fall,' ii. 188.

We have said that Architecture was the parent of the arts, and, without doubt, her first born is Sculpture. It is from sculpture she derives her reliefs and embellishments. Sculpture cuts out the delicate cornice, weaves a tracery over the massive wall, and crowns the column with a capital. Architecture is the naked stone: this more exquisite art dresses and adorns it. Sculpture, therefore, is her handmaid, as well as her offspring.

But, if originally subservient, sculpture ultimately advanced to a foremost place among human pursuits. While continuing to minister to architecture, it acquired a separate mission of its own, independent of any combination; and developed, as it progressed, a host of beautiful characteristics. It impressed the human mind with the finest perceptions of art, by leading it to seek and define them; and, holding the mirror up to nature, traced the softest lines of contour and expression on granite and marble. Grandeur, elevation, sublimity, the tender gesture of pathos and the voluptuous lineaments of love, the ideal and the sensual, were all delineated by its magic chisel, which, at the same time, invested every conception with the graces of form and posture.

It is true, these results did not accrue at once, but, on the contrary, were the slow acquirements of ages. In statuary, as in architecture, sculpture unfolded itself by degrees, revealing first one capability, then another, till it attained the standard of perfection. Its primordial creations were rude, feeble, and abortive. They might be compared with the intellect, grasping, in an undigested mass, the first rudiments of learning; and, in fact, they do represent this phase of the imagination. Their object was to inspire awe, but the effect was unmingled horror —a natural consequence of untaught design and rugged execution. But, though true perceptions of art could not be expected, the failure of primeval efforts was owing as much to mechanical, as to mental incapacity; and we can make allowance for the defects of the sculptor, when we consider the inadequacy of his implements.

Sculpture is noticed by Moses as early as the time of Jacob, B.C. 1800. Rachel, in accompanying her husband to Canaan, surreptitiously carried away with her the gods of her father Laban,[26] and as she concealed them in the camel furniture, on which she sat, they

[26] Gen. xxxi. 34.

were no doubt miniature figures, such as have often been found in Etruria, in further proof of which it is remarkable that the Etruscan images are of a coeval date. Jacob's staff was also surmounted by an image, suggesting the impression that carving in wood, an important branch of sculpture, was now extensively practised. It is difficult to believe that any proficiency in statuary was ever attained by the Hebrews, as it was opposed to the spirit of their religion; and Moses expressly commanded that no iron tool was to be used on the stone composing the altar, evidently from a fear that any relievo, however innocent in itself, might pave the way for idolatry. The figures of the Cherubim, guarding the Ark of the Covenant, were probably of the Egyptian type, as was the brazen serpent; and it can hardly be doubted that the golden calf of Aaron was a counterpart of the Apis, with which the Israelites had been familiar in Egypt.

Etruscan art may be considered the most ancient, as it is the most unique; and for many ages it retained its primitive stamp, so as to be easily distinguishable by the hardness of its lines and the infelicity of the drawing. The naked figure, the human form divine,

was wholly beyond its feeble powers; and the early Etrurian artist had no conception of contour, of symmetry, of the soft delicate curves of grace and beauty. He was ever running into the grotesque, the extravagant—caricaturing, rather than delineating nature. Even his higher efforts exhibited a barbaric taste, and the best figures were deficient in movement, force, and action. As time advanced, the innate vigour of art, by its own developments, threw off some of these blemishes; and imparted a correct outline, breadth of gesture, play, and power. But, to the last, there was a primeval crudeness of conception and execution, an absence of natural grace and expression, that was instantly apparent, and gave every performance the air of an abortion. This character was strengthened by the size of the figures, which are all miniature—the few that exist of larger dimensions being regarded with suspicion; and whether we take the marbles and bronzes, or the paintings on vases and pottery, we everywhere meet with the same deformed lineaments, seeming, as respects both men and animals, to pertain to a creation of pigmies rather than the existing world.

The Etruscans were the first to excel in

engraving on gems. The favourite stones, judging from the specimens extant, were cornelian and agate; and they are usually oval in shape, with a flat face, and convex back. Etruria also presents us with the oldest coin. Money is mentioned by Moses as early as the time of Abraham—'current money with the merchant,'[27] B.C. 1900; but, as it passed by weight, it then probably bore no stamp; and that carried into Egypt by the patriarchs, B.C. 1730, was of the same character. But the Etruscans possessed stamped coin before Troy, which may carry us back to the era of Joseph; and a similar medium was used by the Phœnicians about B.C. 1500, while the Israelites were still in Egypt.

Among the relics discovered at Nineveh, there are undoubtedly some that bear upon their face marks of a primitive chisel, and, whatever date may be assigned to others, these must be ranked with the earliest productions of the statuary. They exhibit, in fact, every characteristic of the infancy of art—hard outlines, rigid ordonnance, grotesqueness of conception, and imperfect execution. The sublime was sought to be represented by magnitude, and majesty by terror. There

[27] Gen. xxiii.

was no perception of grace, harmony, proportion, or perspective. The statue, after exhausting the sculptor's cunning, was hard and senseless as the quarry from which it had been hewn: form, indeed, it had, but, in expression, it was still a rock. As time advanced, the art grew more elaborate, more ambitious, more dexterous, but never more refined. Its relievos, so valuable as memorials of a lost race and age, always partake of the gypsum on which they are graved, never merging into softness or delicacy of touch, but preserving rigidity in every outline. Yet it cannot be denied that they display also massiveness, energy, and breadth. The minutest details are executed with accuracy and force, and, in the human figures, the head, though uniformly in profile, is drawn with boldness and vigour. The battle scenes are often very animated, keeping up the appearance of action; and, could the artist have imparted the life-giving touches of proportion and perspective, these granite pictures might vie in effect with the productions of the easel.

The gigantic figure of Nimrod, discovered by Botta at Khorsabad, is a relic of the later period of Assyrian art, and may be considered

as embodying its highest attainments. It displays the full face, a little inclined to the left; and the features are delineated with considerable expertness. The same skilful hand may be traced through the whole contour, which is drawn with remarkable freedom, and the details, as usual, are executed with care. But, if we miss the primitive rigidity of form, we are at once struck by the want of correct proportion, of harmony, of colour, and the absence of all ideal beauty, which envelopes the figure with the old constraint, and still marks an infantile epoch.

The winged bulls, in the British Museum, as well as our more recent acquisition, the winged lion, both of which the country owes to Mr. Layard, no doubt belong, like the figure of Nimrod, to the later era of Assyrian sculpture. They may possibly have been suggested by the sphinxes of the Pharaohs; but, though partaking of the Egyptian school, they are impressed with the energy and innate vigour of national art. By his skilful delineation of the face, the artist has succeeded, despite of the mythological details, in creating the effects of solemnity, immensity, and awe; and, in the bulls especially, the

figure displays a freedom and vitality which we vainly look for in the sculpture of Egypt.

The religion of ancient Persia, like the modern tenets of Mahomet, prohibited statuary, and hence Persia has confined her sculptural benefactions to the capitals which adorn the columns of Persepolis, and which are themselves attributed to Egyptian artists. Egypt was indeed the school of the art, and furnishes us with its most antique specimens. The misfortune was, that it remained a school, that its pupils were always pupils, adhering unswervingly to the initiatory lessons bequeathed by their progenitors, which, through the influence of the priesthood, acquired the authority not only of immutable principles, but of sacred ordinances.

The founders of Egyptian sculpture were unique in their studio: they selected a precipitous mountain, and chiselled their statue on its face. The figure was of colossal dimensions; and on first striking the eye, might be taken for one of the genii of the rock, half bursting from its surface, half still enveloped in its folds. Human in shape, it was so ruggedly executed, that in lineament, as in height, it represented a monster. The arms

hung powerless by the side; the knees met; the shapeless feet were wedged together. The countenance was broad, flat, and still, but revealing depths of unfathomable gloom, A similar character pervades the smaller statues, restricted to the size of life, and which, in fact, were monsters in miniature, exhibiting, on a diminished scale, the same rigidity of outline, the same stagnant features, the same profound melancholy. There was nowhere any touch of grace, any expression of softness, any of the sweet, tranquil, life-giving light of art. All was a void, because genius, forbidden to exercise originality, could not impart sensibility. The right hand of the sculptor forgot its cunning as he was not permitted to use it; and though he could give the stone a form, his chisel wanted the attribute of life. He might mould, but could not create; and his rigid statue represented, not a living being, but a corpse.

If Egypt was the school, Greece was the temple of sculpture, where its finest conceptions and noblest works were set up for worship. They still claim the adoration o mankind, as miracles of art, although, sharing the vicissitudes of mortals, the gods they represent are no longer venerated. Here it was

that Phidias struck the marble, as Moses the rock, and brought forth a fount of inspiration —limpid, sweet, and sparkling. Here it was that Art took the form of Nature, and consolidated its triumphs by concealing its character. Greece was the very spot to endue it with pathos, tenderness, elevation, and sentiment, to idealize and chasten it, to teach it the beautiful and sublime. Poetry had thrown a spell over the land, laying mountain, wood, and stream under a sort of enchantment, while the aspect of the scenery, now grand and romantic, now soft and subdued, everywhere sustained the illusion. Art partook of the quality of the surrounding objects: it inhaled the mountain air, and clung to freedom; it roamed through the woods, and caught the impress of their beauty; it drank the Castalian waters, and imbibed their inspiration. The sylphs that skimmed the rocks, the nymphs that bathed in the streams, suggested to the imagination, not prodigies and monsters, but forms of beauty and grace, instinct with sensibility and motion. By arraying his works in the charms of nature the sculptor invested them with the witchery of art, imparting to the marble expression and intelligence, diffusing over it

the soft light of animation, giving his statue everything but a soul.

History and tradition equally fix on Crete as the first seat of civilization in Greece. It was to escape from Crete that Dædalus, about 1260 B.C. some quarter of a century before the Trojan war, fitted a raft with a sail, and thus supplied mankind with this useful invention [see p. 85, ante]. The fugitive carried with him the infant arts. The bark that brought to Athens so precious a freight, over a treacherous sea, would now hardly be trusted on the Thames; but in primitive times man often braved great hazard from ignorance of the danger. As Egypt opened to the sculptor inexhaustible quarries in her mountains and rocks, Greece attracted him to her forests, and the statues of Dædalus were formed of wood. But his superior cunning concealed the rude material by the graces of workmanship. Hitherto the limbs had been fastened to the body: he gave them freedom and action. The features, however carefully delineated, had been lifeless; Dædalus opened the eyes, and shed their light over the face. Wood continued to be used in most countries by the sculptor for several centuries. We learn from

Isaiah, B.C. 757, that the idolatrous images of the Hebrews were of wood. 'The smith with the tongs both worketh in the coals and fashioneth it with hammers, and worketh it with the strength of his arms. . . . . The carpenter stretcheth out his rule, he marketh it out with a line: he fitteth it with planes, and he marketh it out with the compass; and maketh it after the figure of a man, according to the beauty of a man. . . . He heweth him down cedars, and taketh the cypress and the oak; . . . he maketh a god, and worshippeth it.'[28] From this passage it is ascertained that the hammer, the tongs, the plane, the carpenter's rule, and the compass were now familiar to the Hebrews; and although said to have been invented by Dædalus and Talus, there is reason to believe that they were known in the East from the earliest times.

The shield of Achilles, being a fabulous production, the work of Vulcan, cannot be cited as an illustration of the arts at the time of the siege of Troy; but, both as a piece of sculpture and a picture, it exhibits the progress made in artistic conception, though we may consider the mind of Homer to have far outstripped the range of human

[28] Isaiah xliv. 12, *et seq.*

performance. This beautiful fabric of the poet's forge comprised twelve compartments, each composing a picture of exquisite design, different in its subject, but blending in a harmonious whole. Vulcan is represented at the work, as it gradually takes shape on his 'eternal anvils'—

'Then first he form'd the immense and solid shield;
Rich various artifice emblazed the field;
Its utmost verge a threefold circle bound;
A silver chain suspends the massy round;
Five ample plates the broad expanse compose,
And godlike labours on the surface rose.
There shone the image of the master mind:
There earth, there heaven, there ocean he designed.'[29]

And the poet goes on to describe, in detail, the subject and effect of each compartment, forming altogether a production that might even task the highest faculties of modern art.

The invention of modelling is ascribed to Rhœcus, a sculptor of Samos, B.C. 780. He appears, like Dædalus, and, indeed, like all the primitive sculptors, to have combined with statuary the practice of mechanics in general, and, taking a step further than his predecessors, he linked his art with materials more durable than wood, forming statues of ivory, brass, and gold, and originating bas-reliefs in metal. He was also acquainted

[29] Iliad, xviii.

with the Etruscan mode of engraving gems, and the celebrated seal of Polycrates, which that tyrant threw into the sea, and miraculously recovered in the belly of a fish, was one of his achievements. But his brazen statues, being the work of the hammer, were rigid and cumbrous, and he secured durability by the sacrifice of expression. Still his images were much admired; and, from this time, brass and ivory became the favourite substance of the gods of Greece.

Toreutic or chased statues were executed with great skill by two brothers of Sicyon, named Dipænus and Scyllis, who augmented the materials of the sculptor by the addition of marble. This substance is specially adapted for the art, yielding to every pressure of the chisel, revealing lines of beauty in every curve, and presenting, under a skilled hand, an illusion so near reality, that we can almost imagine it flesh and blood, seeing the face animated, the limbs glowing with life, and the expanded breast almost rise and fall. The era of Dipænus and Scyllis is uncertain, and they are by some said to be the sons of Dædalus.

Among the works of the Sicyon brothers was a statue of Minerva, formed of a single

emerald, six feet in height. This precious image, which some might be disposed to rank with the fables of antiquity, survived to the Christian era, ultimately finding its way to the treasury of the Byzantine Emperors, where, with other wondrous relics, it was still hoarded at the time of the Crusades.

The school of Chias produced two illustrious sculptors in the brothers Bupalus and Anthermus, who flourished about 530 B.C.; and so embellished their native island with works of art, that they were ultimately permitted to erect a memorial of themselves, bearing the following inscription:— 'Anthermus and Bupalus will render thee, O Chias, more famous even than thou hast become by thy vines,'—alluding to the wide repute of Chian wine. The statues of the two artists were wrought with great delicacy and taste, and the iconic class were remarkable for their *vraisemblance*, insomuch that if we may believe Diodorus, the brothers gave mortal offence to the satirist Hipponax, by executing an image of him in marble, so exactly delineating his repulsive features, that it became an object of horror. The poet in revenge made them the theme of a lampoon, which is lost to posterity, but its satire is alleged to have been so severe

that the unhappy sculptors were unable to appear in public, and, overwhelmed with shame and despair, committed suicide.

The iconic images usually represented the victors in the national games. They inaugurated a new era in sculpture, by introducing, as an essential to resemblance, correct ideas of perspective and proportion, which, delineating the most perfect human forms, laid down certain examples of abstract beauty as principles of art. This system was vigorously carried out by Pythagoras of Rhegium, who, indeed, may be designated its founder, since it was he who, by the accuracy of his contour, first exhibited what may be called the anatomy of statuary.

Myron exceeded Pythagoras in his delineation of nature. He lived during the same century, about 440 B.C., and was a citizen of Athens; but his admirable works were dispersed over all Greece. His image of a cow presented the illusion of life to such perfection, that it even deceived cattle; and the priests of the Athenian temple of Juno were held accountable with their lives for the custody of another of his sculptures—a dog licking his wound, which was deposited in the edifice. But perhaps his most finished work

was the statue of Ladus, the foot racer, said to be equally beautiful in the conception and execution, and exhibiting all the relations of harmony, perspective, proportion, animation, and action.

The steps of Myron were followed by the magic sculptors of the age of Pericles, and the not less glorious era of Alexander. Phidias, the *protégé* and friend of the great Athenian, B.C. 432, stands foremost in this group. His statues are remarkable for breadth and elevation, while always preserving simplicity; and his attention to details exhibits, at the same time, so much grace and ease, and such unvarying fidelity to nature, that it gives expression, so to speak, to every outline. His beautiful sculptures formed the chief embellishment of the Parthenon, and the late Lord Elgin has secured to England the heritage of their remains—a gift for which he received only abuse; but posterity will better appreciate the forethought, uot to say patriotism, which snatched these precious relics from a land of Vandals, and bestowed them in our national museum.

One of the great works of Phidias was his statue of Minerva, made at the request of Pericles, and assigned the chief place in the

Parthenon. This splendid image, which was formed of ivory and gold, rose to the height of thirty-nine feet, and could be discerned above the walls of the city at a great distance. But instead of procuring advancement, it entailed disgrace on the sculptor, who was accused of engraving his own image and that of Pericles on the shield of the goddess; and for this offence was sentenced to banishment. He took refuge at Elis, where he resolved on a revenge worthy of his fame, which was to adorn Elis with a statue superior to the Athenian Minerva. For ten years he laboured assiduously at his design, and finally produced his image of Jupiter Olympius, formed of the same costly materials, and attaining, from the basement of the throne to the summit, the height of sixty feet. The Thunderer was shown seated in a posture of rest; and his sublime countenance, his mighty form, exposed to the waist, his attitude, and the disposition of his limbs, all typified his awful attributes. Golden hair, eyes of glistening gems, and other meretricious decorations, may have disguised the effect of the statue as a work of art; but we cannot doubt that it derived from these additions a certain air of barbaric majesty, calculated to

impress superstitious minds. The people of Elis, indeed, were so sensible of the honour which Phidias had conferred on their city, that they made the guardianship of the image hereditary in his family, and his descendants retained the office till the reign of Nero. Such a prodigy of art excited the cupidity of that tyrant, who wished to remove it to Rome, for the embellishment of the Pantheon; but his envoys, on entering the temple for the purpose, were terrified by a voice from the interior of the statue, threatening destruction to all who aided the operation; and, fearful of the consequences, they reported the undertaking impracticable.

Lysippus and Praxiteles, who stood in the same relation to Alexander as did Phidias to Pericles, illustrate the sculpture of the succeeding century, both flourishing about 325 B.C. Each excelled in his productions, but their respective styles were widely different. Lysippus, while preserving the resemblance of nature, gave less than their real breadth to the head and trunk of his sculptures; and being asked the reason for this innovation, remarked that his predecessors had represented man in his natural form, while he sought to exhibit him as he appeared. The new principle

found favour with Alexander, who declared that his statue should only be made by Lysippus, and inspired by gratitude, as well as genius, the sculptor justified, by his subsequent compositions, the preference he had obtained. No less than six hundred statues emanated from his hand, and, among these, were the images of the twenty-five horsemen drowned in the Granicus, and which, in the age of Augustus, were deemed so admirable, that they were purchased for their weight in gold. The celebrated horses at St. Mark's, in Venice, are said to have been executed by Lysippus; but modern virtuosi dispute their paternity. Clares, the pupil of Lysippus, erected the famous Colossus at Rhodes.

Sculpture owed its highest delicacy of expression to Praxiteles. He it was who founded what may be termed female statuary—the application of the art to the most perfect illustrations of female beauty from living examples. The human form divine, the masterpiece of its Creator, was now represented in its loveliest type. The eye was shown its exquisite curves, its voluptuous contour, its soft delicate outlines, and the rudest mind was refined by the frequent con-

templation of such harmony, perfection, and grace :—

> ' For of the Soul the Body form doth take,
> For Soul is form and doth the Body make.'

The compositions of Praxiteles were often inspired by Phryne, the famous courtesan, who was a miracle of beauty. Her statue, executed in Parian marble, was one of his noblest works, and was placed in the temple of Delphi, as an offering to the gods. Phryne was such an admirer of Praxiteles, that she was anxious to possess the best of his productions; and being distrustful of her own judgment, and desiring to be guided by his, she resorted to the artifice of informing him that his house was on fire, on which the sculptor called out to save his Cupid; and his fair votary no longer doubted what piece to choose. Praxiteles, at a later period, received simultaneously from the Chidians and from the inhabitants of Coa an order for a statue of Venus; and in one image represented the goddess veiled, and in the other naked. The choice was given to the citizens of Cos, who preferred the more modest figure; and the other—

> ' All that the blooming Earth can send forth fair,
> All that the gaudy Heavens could drop down glorious,'

fell to the Chidians. But the superiority of the nude statue was soon acknowledged, and it attained such universal estimation, that Nicomedes, King of Bythnia, offered to pay all the debts of the Chidians, to obtain possession of it; and the proposal was declined.

Statuary never developed a distinct type under the Romans. The art, which was introduced by Greek sculptors in the time of Pompey, always retained its Hellenic character, even after ages of native practice; and the genius of the Roman people failed to give it a national impress. But it was not in artistic beauty that the statuary of Rome was deficient, but in originality, in speciality, in independence. At an earlier period, Rome would have produced nobler, if less finished statues, because they would have partaken of the national traits, and, consequently, have reflected the national genius. But at the time the Romans devoted themselves to sculpture, they were no longer a nation: they had blended with a hundred races, and become a community; and it was impossible to impart a distinction that did not exist. They might copy, but not create: nor could diligence and study awaken aspirations that were withheld by nature.

Sculpture is indissolubly linked with painting; and the two arts, associated from the first, rose and languished together. It is difficult to assign either pre-eminence; but perhaps we may say that sculpture is the more graceful, and painting the more vivid. The one is the embodiment, the other is the reflection—the impression, so to speak, of an image. Both demand the imaginative and descriptive faculties, felicity of conception, and delicacy of execution; but the picture, as a scene, exacts, as it expresses, more than a statue. Hence the skilled painter has been placed on a level with the poet, and Addison describes a picture as a poem without words. But, without disparagement to art, a higher rank may be claimed for poetry; for though the painter must first imagine the picture he represents, he invariably derives its elements from existing objects, which, while practice enables him to group them, his brush can graphically depict. But the poet depends only on his fancy, and, with no medium but words, must transfer to the mind of his reader, not to wall or canvas, the picture conceived in his own. Poetry and painting alike have a great mission, which has exercised a mighty influence over the affections, aspirations, and

actions of mankind; and the real distinction is, that painting addresses the heart through the eye, and poetry through the understanding. This special province of pictures was not overlooked by the classic nations of antiquity, and the temples and principal buildings were liberally embellished with representations of memorable exploits, with a view of familiarising the popular mind with sentiments of heroism, patriotism, and public devotedness.

The honour of having originated painting is claimed by various nations, but neither the source nor the date of its invention can be determined, and, in fact, one might as easily discover the first mechanic as the first artist. Colours, the base of the art, necessarily attracted the attention of man in the remotest times, at the very opening of nature—even in Paradise itself. The gaily-plumed birds, the green woods, and the azure sky, the thousand bright tints of the clouds, as they caught the rays of the rising or setting sun, and, in our later world, the hues of the rainbow, brought constantly before the eye the beautiful contrast of colour, and all its capabilities for combination and representation. In a savage state, man sought to exhibit these effects on his

person, by covering his naked body and limbs with devices in red, yellow, and blue, derived from unctuose plants, or the various tinted clays. To draw the same figures on a slab of wood, a rock, or a wall—in short, to form a picture—was a natural sequel to this outset; and, the initial step achieved, progress depended on time, situation, and the genius, grasp, and mechanical skill of the artist.

The first mention of colours, as a means of embellishment, occurs in the Scriptures, when Moses, by the divine command, calls upon the Israelites to make an offering of 'blue and purple and scarlet,'[30] for the decoration of the tabernacle. But this plainly intimates that colours had been previously used for a similar purpose, and nowhere, indeed, were they more freely employed than in the temples and palaces, if not the private dwellings, of Egypt. The artists of that wondrous land were as ambitious as her architects, and worked for all time. A modern traveller describes the tints on the massive roof of Karnac as still fresh and vivid.[31] But, however rich in colour, the Egyptians were as unsuccessful in pictorial art as in sculpture, and their pictures retained most of the charac-

[30] Exod. xxv. 4.

[31] Melly's 'Khartoum,' i. 177.

teristics of their bas-reliefs. Nor do the Asiatic nations appear to have reached much proficiency in painting, though the art must have been practised in the East from a very remote antiquity; and perhaps the mechanical pictures of the Chinese, if in some respects unique, still presérve to us, in their monotonous, unvarying patterns, specimens of the earliest compositions of the Oriental pencil. The rice-paper paintings usually display lightness of touch, gorgeous colouring, and some sense of harmony; but, like all the productions of those ingenious barbarians, they exhibit neither novelty nor invention. There is no attempt at design, no idea of creation: the figures are immovable, and, consequently, the whole picture is inanimate. It is as if we looked for a dramatic performance, and found a puppet-show.

India was as backward as China in the cultivation of painting, and the art has never flourished, nor even taken root in Persia, where the same religious ordinance which prohibited sculpture, operated to the discouragement of pictures. In Assyria, on the contrary, they were highly esteemed by every class, and applied to the embellishment of the temples, the royal palaces, and the stately

abodes of the nobility. It is probable that the Assyrians originated the art of painting on pottery, though it was carried to great perfection, at a very ancient period, by both the Phœnicians and Etruscans; and vases of rare beauty are still extant, to attest the skill and artistic excellence of the latter. The prophet Ezekiel, while in captivity at Chebar, at a later epoch, may have been employed in this work, as he alludes to the conventional practice of decorating the walls of Assyrian houses—'Men pourtrayed on the wall, the images of Chaldeans pourtrayed with vermilion: Girded with girdles upon their loins, exceeding in dyed attire upon their heads, all of them princes to look to, after the manner of the Babylonians of Chaldea, the land of their nativity.'[32] Flowers were also a favourite embellishment for panels, and the same style of decoration prevailed in Egypt, where, however, as in Assyria, pictorial representations were usually delineated with the chisel, rather than the brush, the artist being reduced to work on stone. With the easel, indeed, he was, as regards effect, powerless. Egyptian painting has all the glaring faults of Egyptian sculpture, and it has, besides, a broad inherent

[32] Ezek. xxiii. 14, 15.

feebleness, from which the sculptor often escaped. The perpetual profile, with the absurdity of a full front eye, and display of both shoulders, occurring in every figure, without relief or variation, excites a sense of disgust, while the total absence of foreshortening, of proportion and perspective, gives the composition a puerile character, destroying all interest in the scene, and wearying by its monotony. But, if thus deficient in execution, as they were impotent in conception, their fabulous durability of colour ensured their preservation; though, as the mummies come down to us without a semblance of nature, so these tableaux present a careful obliteration of every principle of art.

Painting is not mentioned by Homer, B.C. 907, but we can hardly doubt that the art then existed in a rude state, as the next century witnessed its highest development in Greece; and the father of poetry, so historic in his allusions, describes the tapestry woven by Helen as elaborate in design and varied in colour:—

> 'Her in the palace, at her loom she found;
> The golden web her own sad story crown'd,
> The Trojan wars she weav'd, herself the prize,
> And the dire triumphs of her fatal eyes.'[83]

[83] Iliad, iii. 171.

As the taste for painting became popular in Greece, exhibitions were established at Corinth and Delphos, which foreshadowed, in their day, the modern shows of the Royal Academy and the Louvre. It was at Delphos that Panenus, B.C. 450, displayed his picture of the battle of Marathon, in which the leading chiefs were drawn from life, and given their full stature.[34] Some ages previous, a battle-piece was painted by Bularchus, and afterwards sold for its weight in gold; but this is the first historic painting of which we have any description. Panenus was the brother of Phidias, who himself studied painting, before he was led, by some fortunate accident, to devote himself to the more durable art of sculpture. Timagoras, Polygnotus of Thasus, and Apollodorus, successfully cultivated the art; and Pliny especially commends two works of the last-named artist—a priest in a suppliant posture, and Ajax struck with Minerva's thunders—which were extant in his time at Pergamus.[35] Apollodorus was the instructor of Zeuxis, who, in his accurate delineation of nature, surpassed both his master and all his contemporaries, B.C. 415. One of his paintings represented a child

[34] Plin. 35. [35] Plin. 35, 9.

holding a bunch of grapes, and was so faithfully executed, that birds came to peck the fruit; but Zeuxis, though at first flattered by this homage, acknowledged that there must be some defect in the picture, as the birds were not frightened by the child. A composition by his rival Parrhasius was exhibited at the same time, and on its appearance, Zeuxis called to him to remove the curtain, and expose the painting, but, according to the story, the curtain was the subject, and Zeuxis confessed he was vanquished, observing, 'Zeuxis has deceived birds, but Parrhasius has deceived Zeuxis himself.'[36] Zeuxis was employed by the Crotonans to paint a picture of Helen, and in order that he might be at no loss for a model, was permitted to select five of the most beautiful virgins of the country, from whose varied charms, blended in one figure, he produced the most perfect conception of the female form that had ever been seen. From the compliments and encomiums he received, Zeuxis became so vain, that, at last, he refused to sell his productions, declaring that no money could repay him for their composition. He claimed to be the chief of his art; and on one occasion presented himself at the Olympic games in a

[36] Hor. 408.

purple robe, embroidered with gold, as an indication of his sovereignty, an act which was imitated by Parrhasius, who would not yield the pre-eminence. The last performance of Zeuxis was a picture of an old woman, remarkable for the ludicrous cast of her countenance; and it produced such an effect on himself, that, on imparting the finishing touches, he burst into a violent fit of laughter, which caused his death.[37]

Pamphilius and Theon contributed to the advance of the art; but it derived its most precious acquisitions from Apelles, who never suffered a day to pass without using his pencil. The exquisite composition of this artist's pictures, attested by the greatest authorities of antiquity, did not surpass their fidelity, which, indeed, was so striking, that the figures seemed to be animated. This painting of Alexander grasping a thunderbolt was seen by Pliny, who affirms that, at first sight, he thought the hand and its missile protruded from the wall.[38] In another picture, the Macedonian hero was represented on horseback, and, on seeing it, he indulged in some unfavourable criticisms on the figure of the steed; but, at this moment, a real horse passed by, and

[37] Ci. de Juv. ii. 1. [38] Plin. 35, 10.

neighed at the animal in the painting, on which Apelles exclaimed, 'One would imagine, sir, the horse was a better judge of art than you.' Such freedom of speech was forgiven in the artist, to whom the hero, so generous in his partialities, was not more a patron than a friend; and, indeed, he carried his liberality so far, that he presented him with his favourite mistress, who, while sitting for her picture, had inspired the painter with an unconquerable passion. Apelles was not usually averse to criticism, but, on the contrary, exposed his pictures in a public place, where, unseen himself, he could listen to the observations of the passers by; and a story is told of his having altered the sandals of one of his figures, in deference to the strictures of a cobbler. The result, as the picture was still exhibited, was observed by the critic; and, elated at his success, he ventured on a criticism of the leg, but here he was at fault, and Apelles, stepping from his covert, dealt him an austere rebuke.

Apelles afterwards enjoyed the same patronage from Ptolemy which had been extended to him by Alexander. The favour he obtained in Egypt made him an object of envy, and, desiring to effect his ruin, a cabal

at the court sent a messenger to his house with an invitation to sup with the King. At the appointed time, Apelles accordingly attended, and discovered that he had been hoaxed. For a moment he was confounded, being unable, from his ignorance of the language, to explain the circumstances to the monarch; but he then drew the figure of the messenger on the wall, when the likeness was recognised by Ptolemy, and the trembling artist was excused, while his enemies were severely reprimanded.

There is little to say of the practice of painting by the Romans; for though they must have been constant spectators of the remains of Etruscan art from the earliest times, they exhibited no appreciation of pictures till the accession of Augustus, when, with the spoils of the world at his feet, that prince embellished the city with a prodigal hand. Up to this period, the genius of the people had been essentially military, and their pictures, like their statues, were an importation from Greece. So little did they understand of the art prior to their capture of Athens, that the Roman general, on despatching to Italy one of the masterpieces of Hellenic art, made a contract with the master

of the vessel, that if the picture, during its passage, should sustain any damage, he was to replace it by one quite as good, and the sapient mariner readily agreed to this hard bargain, which it would have required a necromancer to fulfil. *Sic itur ad astra.*

VI.

LITERATURE AND THE DRAMA.

THE human mind has in nothing so excelled as in literature, which, giving form to the ideas, embodies all it knows, and inculcates all it can learn. Even apart from its functions, which are so multiform, so diverse, it takes a paramount place of itself, by virtue of its integral character. It is the interpreter of the arts and sciences, which are merely acquirements, the gift of observation and practice, while literature, springing spontaneously from the mind, is a creation. Hence we have not classed it with the fine arts, with which it is usually associated. It has, indeed, a distinct existence, an existence more ancient than either art or science—anterior, in its oral development, even to the invention of letters—perhaps almost coeval with language itself.

It would be interesting to trace the primary efforts of composition as they first arose in the human mind; and could they be recovered,

they would supply a beautiful page in its history. There we should see the power of the intellect to arrange its ideas, without grammar, without art, without tuition, by a rude instinctive sense of method and propriety. Possibly there might be something to provoke a smile, a homeliness and coarseness of language, no graces of style or diction, no grasp or depth of thought; but, on the other hand, there would, without doubt, be perspicuity and precision, for these are the inherent qualities of reason. Nature always expresses itself with simplicity; and the effect, even if not imposing, could not but be impressive. But, putting aside their literary calibre, such productions would be invaluable as revelations of the rise of thought, illustrating the first development of information and deduction; and, to the philosophic eye, they would open a mine of research, fruitful of instruction and interest.

For memorials so primeval to have escaped the hand of Time would indeed have been a miracle, though literature has really proved imperishable—though the thoughts of man, impressed on wax or linen, have survived the fall of empires and the disappearance of languages, carrying us back to a period

when all is lost in the mists of fable. Far, however, as they extend, these are not the compositions we seek: they do not show us mind in its infancy, in its first crude efforts, but speak of something still beyond. What can we infer but that literature, contradiction as it may seem in terms, was in the first place oral—that, long before the discovery of letters, the intellect found a channel for its conceptions in traditions, in songs, in lyrical effusions, circulated at solemnities and festivals, and handed down to other generations? This is a natural conclusion, and, in fact, is susceptible of proof. At the same time, it offers the highest testimony that could be adduced to the might of literature, which thus overrules every opposition of time or circumstance, and every social impediment. Poems transmitted from mouth to mouth, depending for their preservation solely on the memory of individuals, are, indeed, after an interval of thousands of years, still in existence, and are even more familiar to modern than they were to ancient students. A few of these pieces claim such a remote antiquity that no date can be assigned to them; and some of the metrical passages in Job, are believed to have been composed before the Flood.

There is every presumption that oral literature, if we may use the phrase, first developed itself in poetry—not the poetry of a more civilized age, regulated by set rules and canons, and which might be compared to a cascade, gliding too placidly down its channel; but a poetry gushing headlong from the imagination, in no prescribed form, and under no constraint—a mountain torrent, wild, swift, and free. The subjects were those most congenial to people in a savage state—the achievements of warriors, the adventures of the chase, encounters with predatory bands and fierce beasts of the forest, related with the enthusiasm of a kindred spirit. A degree of metre would be imposed by the modulations and cadences of the voice, dictating a sort of chant; and soon it became customary to accompany this with a lyre, combining the charms of poetry and music. Such has been the invariable character of the poetry of young nations, as well in comparatively modern as in primitive times; and the bards of ancient Germany and Scandinavia, of Caledonia and Britain, represent, in effusions precisely similar, the same phase of human thought.

Nevertheless, it is a notable fact that the oldest written work extant is in prose, and

takes the form of history, which is by some considered the highest and is certainly the most advanced type of literary composition. Apart, indeed, from the circumstance that its statements are of divine origin, the Pentateuch evinces inspiration by its phraseology; for in aptitude of diction, simplicity and sublimity, it stands alone in the whole circle of letters. The subject is opened at once by a mighty announcement, expressed, as it were, in a word, yet with such felicity, that, not only is there no abruptness, but we are instantly made to comprehend the momentous fact. All the successive steps of the creation are described in the same impressive manner. The sacred historian makes no attempt to depict the convulsions which attended the birth of nature: he simply notes, without remark or comment, the various stages of the event. There is no straining after effect, but the effect is only the more startling; and the pagan Longinus, a derider of the Jewish theology, could not repress his admiration of the sentence—'Let there be light: and there was light.'

No less natural and no less vivid is the description of the delivery of the law from Sinai. Here the Deity appears enveloped in

terrors; the mountain quakes at his presence, and shrouds itself in smoke; he is surrounded, as with a mantle, by thick darkness, thunders, and lightnings; and, above the raging tempest, a trumpet is heard, making the people tremble. But these awful features of the scene are enumerated with a brevity which never interrupts the narrative, though they give it such thrilling emphasis; and this record of one of the greatest events of the world's history, displays a grandeur and elevation of thought, which are amplified by its simplicity.

In the history of the Patriarchs, the great Hebrew, while ever preserving the same characteristic, exhibits faculties of a different order, and numerous incidental allusions afford us a picturesque idea of those primitive times. Various scenes are described with a power and pathos which may truly be called divine; and there are few who have not shed a tear over the reconciliation of Jacob and Esau, the reception of his brethren by Joseph, and the happy meeting of Joseph and his father. Moses, though he excelled in prose, also takes a high place as a poet, and the song he composed in conjunction with Miriam, and, still more the 90th Psalm, are noble

examples of his skill. Sacred minstrelsy was assiduously cultivated by the Hebrews, and it is evident that schools for the art were established at an early period, since we find them existing under Samuel; and, after the troubles with the Philistines, they were re-organized by David. The royal bard was himself the most successful, as he was the most skilled of the Jewish minstrels; and, as sacred compositions, his Psalms are unequalled in sublimity and grandeur. Nothing can compare with his vivid conception of the Divine Majesty and Power, as expressed in the 104th Psalm, and, more particularly, the description of God's invisible presence in the 4th verse—'He layeth the beams of his chambers in the waters; He maketh the clouds His chariot, and He rideth upon the wings of the wind.' Solomon, though trained by such a sire, was an inferior poet; but his writings exhibit a deep, if bitter knowledge of human nature, and a worldly experience applicable to all countries and times. Among the prophets, Isaiah and Joel take the first rank, but perhaps the latter, though not so widely appreciated, more uniformly partakes of the elevation of his theme. The Jewish histories are scant, but are distinguished by their grasp

of incident, their great force, aptitude, and quaintness of expression. Occasionally they present us with remarkable scenes, described with vividness and power; and, among these, none are so striking as the account of the interview of the prophet Micaiah with the two kings, of the revolt of Jehu, and of Elijah's meeting with the Almighty. The Babylonian captivities, destroying the national institutions and character, necessarily exercised a baneful effect upon literature, and this is manifested in the writings of Jeremiah and Ezekiel, both of whom, compared with the earlier prophets, are literal and discursive. Ezra re-established the sacred college of minstrels, and gradually the Jewish schools recovered their repute, which was widely extended by the celebrated Gamaliel. Nor did learned Rabbis confine their mission to the circle of their scholars, but held frequent disputations in public, for the information of this people; and it was at one of these discussions that the Redeemer, when in his twelfth year, was found in attendance, listening to the expositions of the doctors, and confounding them by his questions.

The Chaldeans seem to have made no progress in pure learning, confining their attention

to astronomy as inductive to astrology, and to divination and magic. It is true that, so early as the reign of Belus, a literary association, the first 'Royal Society,' was established at Babylon; but, from all that appears, it devoted itself to the prevailing delusions, rather than to the extension of knowledge, and, consequently, imparted no impulse either to science or letters. The ancient literature of the Hindoos, though infected by similar themes, is illustrated by the *Vedas*, which probably come next to the Old Testament in antiquity, being at least coeval with the reign of David, B.C. 1040. But the Hindoo histories are mere fables, of comparatively modern invention, and our earliest authentic information respecting Indian history dates only from the Mahomedan conquest, under Mahmid, Sultan of Ghuzni. Persia produced the *Mahabbarit*, an epic poem, referred to the era of Solomon; but competent judges pronounce it a barbarous effusion; and, in fact, her Magi and learned men, following the steps of the Chaldeans, were too much absorbed by the black arts to devote any attention to literature. The Chinese literati confined themselves to the study of their language, which, requiring a life to master,

presents a formidable obstacle to literary development; but they account for their want of an ancient literature by continually recurring to the doubtful conflagration of B.C. 246, [see p. 31, ante,] which they cannot prove to have occcurred. A similar cause operated to repress literary genius in Egypt. The jealousy of the priests, restricting education to their own caste, committed the treasures of primeval wisdom to cabalistic books, comprehended only by themselves; and the result was to arrest the growth of literature, which was thus strangled in its cradle. But, though her light was extinguished—though none of her early manuals of knowledge remain, Egypt, in her day, undoubtedly possessed a copious literature; and so early as B.C. 1500 Moses bears testimony to its existence. At a later day her schools were the resort of the most eminent philosophers of Greece; and, while her monuments furnish indelible lessons to modern times, she must be awarded the high title of Preceptress of Antiquity.

If we are indebted to the Egyptians and the Hebrews for the germs of literature, for the oldest memorials of its existence, we owe its extension and general application to the

Greeks, who, indeed, have bequeathed to us some of its noblest achievements and richest treasures. Poetry was inherent in the very nature of the Greeks, linked with their religion, and even impressed on the features of their country, where, from time immemorial, every natural object had its legend, and wood and stream and lonely dell were haunted by invisible beings. With the Hebrews poetry had been a sacred art, dedicated exclusively to the Deity; and, as such, it reached the highest flight in the grandeur of its imagery, the fervour of its thoughts, and the elevation of its subject. But now it assumed a new phase: in the classic groves of Greece the Muses took a wider sweep, and touched the chord of humanity. The poet, so observant and so susceptible, was here in the midst of associations and of scenery which kindled the imagination, and he instinctively caught the reflection of their romance, and the image of their beauty. Love and war by turns engaged his lyre: and while he described the aspect of the surrounding landscape, the fruitful plain, the winding river, the mountain clothed with crag and forest, or blooming with heather, the sea in its calm or in its fury, all that was lovely and sublime in nature, he, at the same

time, breathed the tender accents of passion or depicted the terrors of battle, recited the trials of lovers or the adventures of heroes. In short he grasped the whole range of human sympathy, as then and there awakened; and, by this talisman, entranced at once the fancy and the heart.

The great name of Homer stands out on the roll of poets like a landmark—like a beacon, not only as regards the bards of Greece, but in comparison with those of all lands and ages. It was his hand that gave us the first delineation of nature, both inanimate and human—a photographic picture, seizing all its varied charms and diversities, with an accuracy, a fulness, and a power which, to judge from the result, left to future poets only the humble task of repetition. His immortal productions, the *Iliad* and the *Odyssey*, form the root, as they must ever remain the models, of epic poetry, and have respectively been compared by Longinus to the sun in its meridian and its setting. The *Iliad* is especially remarkable for the sublimity of its imagery, the sweetness of its verse, its grasp of subject, endless variety of incident, and profound mastery of the human heart. At this day, it gives us a faithful representation of an epoch

which, but for its graphic descriptions, would never have been known to exist; and we receive it as the authentic testimony of poetry before the birth of history. Controversialists, indeed, have exercised their ingenuity to prove that the *Iliad* is only a collection of odes, the work of different minds; and Homer is simply conceded the merit of their fusion, even when he is allowed to have existed. But this is the ordinary epitaph of human fame; and mankind rejects the infidel theory. The *Iliad* is itself a convincing witness to its fallacy, for no other work exhibits such perfect symmetry of construction, such harmony of parts, such invariable, though unobtrusive, evidence of design. Nor has any other literary composition ever acquired the same ascendancy over the human race.

The era in which Homer lived has been variously stated, being by some placed as coeval with the siege of Troy, B.C. 1200; and by others at 160 years later; but the Arundelian marbles, a more precise authority, fix his epoch at about B.C. 907. His right to be regarded as the first master of the Grecian lyre is equally a subject of dispute, and rival claims are advanced for Musæus, Orpheus, Olên, and Hæsiod. For the last alone has

any tangible evidence been adduced, and this leaves it doubtful whether he was the precursor, or the contemporary of Homer; while a great modern authority, whose research leaves no ground unexplored, even considers him to be posterior.[1] 'The oldest of the epic poets,' adds Grote, 'to whom any date carrying with it the semblance of authority is assigned, is Arktimus of Miletus, who is placed by Eusebius in the first Olympiad, and by Suidas in the ninth.'[2] But though it may be an error to regard Homer as the first Greek poet, no one has risen to dispute with him the honour of being the first schoolmaster, and the inhabitants of Scio still show the rock where, according to tradition, he established his school, and sat in the midst of his pupils. Assuredly he could have enforced no more instructive studies than his own poems, whether as masterpieces of composition, as historic narratives, as compendiums of geography and general information, and as revelations of human motive and passion. Nor can imagination picture a scene more sublime than the blind minstrel in his circle of scholars, communicating by word of mouth, and in the loftiest strain of song, the annals of a past age,

[1] Grote's 'Hist. of Greece,' ii. 160. [2] Ibid. ii. 163.

trusting to the perishable tablet of man's memory a record which was indeed never to be forgotten and never equalled.

Are we, then, to conclude that instruction was conveyed at primeval schools through the medium of songs, and that the schoolmasters were poets? There is evidence that the seminaries of the Hebrews were of this character, and many of the Psalms are historic, reciting, in a manner calculated to impress the mind, the actions and experiences of past times. The poems of Homer, though so different in style, fulfilled the same purpose for the Greeks, and their preservation depended entirely on popular favour till the era of Pisistratus, when, for the first time, they were committed to writing, henceforward forming the chief attraction of a library established at Athens. Till a much later period, however, no person was deemed educated who could not promptly repeat any passage in Homer with perfect correctness; and the *Iliad* was such a favourite with Alexander, that he carried it in his pocket, and at night always slept with it under his pillow. On one occasion he gave an interesting proof of his partiality for the great national epic, when, after his victory over the Persians, he

was presented with an inestimable casket, found in the tent of Darius, and told that it ought to be appropriated to the most precious thing in the world, on which he ordered the *Iliad* to be placed in it, declaring that nothing on the earth could compare with it in value.

Orpheus, who has been held to be anterior to Homer, is by Aristotle pronounced a fabulous personage, and if he ever existed, was probably a contemporary of King David, which would place him at about 1000 B.C., or a century earlier than the blind bard. The last of the epic poets of Greece was Eugammon, the author of the *Telegonia*, who is stated to have lived in the 53rd Olympiad, B.C. 566.[3]

The practice of reciting verses with the accompaniment of music introduced a new order of poetry, called the lyrical, which, being especially congenial to the sprightly temperament of the Greeks, acquired such a wide popularity as almost to supersede the epic. The elder bards had confined themselves to hexameters, but the Muse now revelled in diversity, and with lyrical poetry rose the iambic, elegiac, and choric.

[3] Grote's 'Hist. of Greece,' ii. 163.

Of the lyrical poets, the most interesting is Sappho; for though her productions, which once exercised such power, have perished, with the exception of some precious fragments, her wild story still commands human interest, when the impress of her genius has all but passed away. She was the first to communicate to poetry the intense feeling, passion, and sentiment of the gentler sex, heightened by the tender fervour of a susceptible heart. Let us lament that those incomparable strains, reflecting the tone of the age and her country, were tainted with licentiousness, which others, with less excuse, were too ready to imitate and perpetuate. Yet often she expressed herself with a purity and sweetness worthy of her lyre, and we recognise the touch of the Tenth Muse, as she was justly designated, in a stanza preserved by Demetrius Phalereus, and thus rendered by Byron:—

'O, Hesperus! thou bringest all good things—
Home to the weary, to the hungry cheer;
To the young bird the parent's brooding wings;
The welcome stall to th' o'erlaboured steer:
Whate'er of peace about our hearthstone clings,
Whate'er our household gods protect as dear,
Are gather'd round us by thy look of rest,—
Thou bring'st the child to the mother's breast.'

Scarcely a fragment remains of the poetical effusions of Alcæus, Ibycus, and Simonides.

though the last, who is reported to have added four letters to the Greek alphabet, did not confine himself to lyrical pieces, but also wrote several dramas and epics, which obtained a wide popularity. He was reputed to be a great favourite with the gods, and it is said that, on one occasion, when the roof fell in, at a house where he was seated at a banquet, his life was saved by a miraculous interposition, while the rest of the assembly perished. Time has dealt more leniently with the works of Pindar and Anacreon, whose genius is still represented in the temple of letters. Pindar, like Simonides, was awarded a statue by his countrymen; and so cordially did all classes in Greece unite in the encouragement of literature, that the laureate priestess of Apollo announced it as the will of the god that Pindar should annually receive the half of the first fruit offerings made at Delphi. On the capture of Thebes by the Spartans, the excited victors evinced their veneration for his memory, by sparing the house where he had resided, and afterwards the same forbearance was shown by Alexander the Great, though he reduced the remainder of the city to ashes. Pindar's compositions are remarkable for grandeur and elevation of expression, sub-

limity of thought, and nervous energy and elegance, attuned by great sweetness of rhythm and melody. In his youth, he had the advantage of receiving instruction from the accomplished Corinna, and the no-less gifted Myrtis, B.C. 500; and a legend affirms that his future eminence was confidently predicted, from the circumstance that, one day, when asleep, some bees deposited honeycomb on his lips. In an early contest with Corinna, however, the prize was awarded to his fair competitor, though she is believed to have influenced her judges more by the beauty of her person than of her poetry.[4]

Pindar excelled in music, and accompanied the public recital of his verses with a lyrical performance, the effect of which was aided by modulations of the voice, and suitable action and gestures. All these aids would have been wanting had his compositions only been made known by books; but they were promulgated according to the established usage, at popular assemblies and solemnities, and in the great national temples, where these accessories could be brought into operation, while, at the same time, the poems were thus diffused among all classes.

[4] Pl. Al.

Like Simonides and Pindar, Anacreon was adjudged a statue, but it represented him as a drunken old man, carolling a bacchanalian song; and this unenviable honour, while it typified the course of his life, punished his abuse of the Muse. His lyrics, however, though marred by licentiousness, are exquisitely soft and harmonious; and Horace pronounced them inimitable.[5] Byron translated the least objectionable of his odes, and many will recall the vigorous lines—

> 'I wish to tune my quivering lyre
> To deeds of fame, and notes of fire.'[6]

The historians of Greece have left a rich bequest to literature in the works of Herodotus, Thucydides, and Xenophon, which, after the lapse of so many centuries, are still familiar to every educated mind. Pastoral poetry was successfully cultivated by Bion and Theocritus; and both poetry and rhetoric elicited a treatise from Aristotle. No subject, indeed, was neglected by that universal philosopher, who imparted a greater impetus to the literature and science of antiquity than any other individual. His writings have been compared with those of Plato; but, though they exhibit

[5] Hor., 14, 20.

[6] 'Hours of Idleness.'

the same felicitous diction, they are essentially different in character, dealing with the phenomena and economy of nature, the stubborn domain of facts, while those of Plato are shaped by art, by the errant dreams of the imagination. Still, Plato has vied with Xenophon in the zealous effort to preserve the sayings of their great master, Socrates; and from them we derive a faithful memorial of that divine man, the greatest figure of the heathen world.

Literature, like the other fine arts, was in the earlier ages of their history unknown to the Romans; but about B.C. 275 the conquests of Sicily and Greece opened to them the erudition of antiquity. It was a Greek slave—Livius Andronicus—who introduced them to the strains of Homer, which he disguised in barbarous Latin. But from this period, B.C. 243, literature took root at Rome; and, though its poetry retained the impress of a Greek origin, many immortal productions emanated from Roman authors. The first important historical work was composed by Cæsar, and, under its name of *Commentaries*, is known in every modern school. Varro, so eminent for his learning, wrote upwards of 500 volumes, all of which

are lost, with the exception of an insignificant treatise. Virgil was the first of the Roman poets, as he was also incomparably the greatest. Even in him, however, the Hellenic type is discernible; and we see that he drew his inspiration from the Castalian fountain—from Greece—from the undying verse of Homer and Theocritus, rather than from his own breast. Yet never had nature a more diligent student, or a more cunning delineator. It was not, then, that he was unobservant of her beautiful lineaments, but that they had been caught up and portrayed by the great spirits of an earlier epoch; and the pictures of those masters—their vivid descriptions—took possession of his mind, almost to the exclusion of the real objects. Thus the *Georgics* professed to describe Italy, but the scenery, the sky, every aspect of nature, was from Greece. In the *Æneid* he designed to give Rome an epic, which might claim to be national, but he was unable to shake off the spell of Homer; and he acknowledged, when his task was half finished, that it was but a copy of the *Iliad*. In his last will, he desired that it might be burnt, fearing that it would jeopardise his fame; but fortunately his injunction was not complied with, and Augustus claimed the

merit of having saved Troy from a second conflagration. But despite his Hellenic leanings, the works of Virgil are replete with imagery, fancy, thought, and sentiment. In the sweetness of his verse and the harmony of his numbers he is unsurpassed; and he will ever occupy a foremost place on the roll of poesy.

The same age which produced Virgil gave the world Horace and Ovid, B.C. 45. Horace followed Virgil in his imitation of the Greek bards, and, perhaps, the more readily, as he had spent part of his youth at Athens, where his father, originally a slave, sent him to complete his education. Both Horace and Virgil owed much to the patronage of Mecænas and the unbounded munificence of Augustus. They were constant visitors at the Emperor's palace, and guests at his table, where, with the one on his right hand and the other on his left, Augustus often remarked that he sat between sighs and tears, alluding to the short breath of Virgil, and the watery eyes of Horace. Horace was sincerely attached both to the Emperor and Mecænas: the latter he survived only three weeks, and, in his will, he directed his bones to be burnt with those of his friend, while he left all his possessions to Augustus.

The same imperial patronage was extended to Ovid, but he early forfeited the Emperor's friendship, and, in the zenith of his popularity, was suddenly banished to Tomos, on the shore of the Euxine. The cause of his disgrace is unknown, but it has been attributed to his accidental discovery of one of the imperial amours—a conjecture which, in the absence of other evidence, appears to be borne out by his own cautious allusion.

'Cur aliquid vidi? Cur noxia lumina feci?
Cur imprudenti cognita culpa mihi est?
Inscius Actæon vidit fine veste Dianum
Prœda fuit canibus non minus ille suis.'

Ovid's best poems are his *Fasti*, of which only six books remain; but all his productions, though deeply marked by the faults of his character — by indelicacy, sycophancy, and meanness—bear the stamp of genius, uttering its conceptions now in the softest music, now in words of fire.

Literature was by this time illustrated by the valuable grammatical works of Callimachus, Apollonius Rhodius, Aratus, Nicander, Eratosthenes, Zenodotus, the Byzantine Aristophanes, and his pupil Aristarchus, who, excelling his tutor, wrote no less than 800 commentaries on authors of repute, and was deemed such a master of criticism, that, for a

long period, it was customay to describe all critics as *Aristarchi*, in commemoration of his powers. But Longinus, the master and minister of Zenobia—'sublime Longinus,' who gave criticism its laws and principles—is more highly prized in modern times.

History rapidly enlarged its proportions, and in Greece was enriched by the researches of Polybius, Dionysius of Halicarnassus, and Diodorus Siculus, while Rome produced Hirtius, Sallust, Cornelius Nepos, and Livy. The roll of poets had been inscribed with the honoured names of Tibullus, Lucretius, Catullus, and Propertius. Phædrus, a slave, furnished the Roman world with an elegant version of the fables, which Æsop, also a slave, had given to the Greeks nearly five centuries before; and, like Æsop, he was rewarded for his wit by the gift of his liberty.

Eloquence, so illustrated in Greece by Demosthenes, was at Rome reduced to an art by Cicero, as it had already been by Aristotle; and natural history, which the Stagyrite may be said to have founded, acquired new facts from the labours of Theophrastus and Lucretius.

But this golden period of ancient literature

received its richest acquisition from Ptolemy Philadelphus, who may be regarded as ushering in the epoch which extended to the reign of Tiberius. From the Egyptian potentate we inherit, among other gifts, the precious bequest of the Old Testament, which, by his command, was translated into Greek by the Seventy. Such a volume fitly inaugurated the flood of light, now diffusing itself over the human mind, soon, alas! to be succeeded by an eclipse, which, however, the same Holy Scriptures were, in the end, finally to dispel.

The era opened by the Old Testament, closed with the appearance of the New, composed by the four Evangelists, and the five Apostles, Peter, James, Paul, Jude, and John; and it is a curious fact, that the first operation of this divine volume, framed to emancipate the soul as well as the mind of man—a mission it has so signally accomplished—contributed to hasten the decay and neglect of letters. This was a consequence of the prevailing tone of literature, as well as of the subject of the New Testament; for though the effect of the first promulgation of Christianity was to absorb the feelings and imagination to an extraordinary degree, it was no less

active in diffusing a high sense of moral purity, which shrank from the licentiousness of heathen authors. Hence the daily increasing community of Christians entirely abjured profane literature; at the same time, the spread of luxury so corrupted the upper classes of society, that they gave themselves up to the pursuit of pleasure; and books ceased to be studied and almost to be written.

All this was not the work of a day, or of a single age, but of generations. The human mind was passing through a new phase, essential to its perfect development, and was, as it were, to die—to go through the grave, like the body—ere it could be born again, and shake off the slough of paganism for the bright garment of Christianity. Wars and revolutions contributed their share to the discouragement of learning; and though some of the Roman Emperors were imbued with a literary taste, the character of the government was adverse to the exercise of the intellect. The brutal sports of the amphitheatre and a grovelling drama operated in the same direction, and the time and circumstances everywhere combined to check the growth of literature.

Yet the period of decline was adorned by

some immortal names, conspicuous among which are those of Quintilian and his pupil, the younger Pliny, Plutarch, Seneca, Lucian, Pausanias, Dion Cassius, Valerius Maximus, Tacitus, and Suetonius. The *Institutiones Oratoricæ*, the greatest work of Quintilian, was for nearly fifteen centuries supposed to be lost; but at length, about A.D. 1415, it was discovered in an old tower of a monastery at St. Gal, by a Florentine student, named Peggio Bracciolini. The writings of Petronius Arbiter are valuable only as illustrating the universal corruption of society, which Juvenal, with more power and more authority, has depicted in his *Satires*. Some pedantic works on philology say little for the scholarship of the time, which grew more arrogant as it became more restricted, but derived a degree of respectability from the writings of Ptolemy, and a few others, most of which, however, are now known only by repute. The character of literary men had greatly degenerated since the days of Horace and Virgil, and is exemplified in the lives, as well as the surviving works of those who exercised the greatest influence on literature, more especially in the case of Martial and Lucian. The former was a servile adulator of

the tyrant Domitian, a derider of morality, and a scoffer at religion: the latter, a dependent on the Emperor Aurelius, exhibited in his dialogues the same qualities which Martial displayed in epigrams, and obtained the unenviable appellations of atheist and blasphemer.

In the midst of general decline and debasement, learning still made some expiring efforts in the East, and Judæa produced her celebrated historian, Flavius Josephus, and gave birth to the *Talmuds*, the *Mœsora*, and the *Cabbala*. Several poets appeared in Arabia, and the lyrics of Abu Tamar are still extant, and still admired. Poetry is even said to have extended to Caledonia; and the wild glens of the Highlands, inhabited by a congenial but poetic race, now, if we may believe tradition, resounded with the strains of Ossian.

In ages when books were composed of tablets, or, at best, were confined to manuscripts, the number of copies was necessarily limited, rendering circulation dependent on the formation of libraries, accessible to all classes. Hence the libraries of antiquity were of colossal size, and played a great part in the diffusion of knowledge. A library was esta-

blished at Memphis as early as the reign of Oxymanderus: this, of which no particulars have been preserved, is the first on record.[7] Another was formed at Athens by Pisistratus, who deposited on its shelves the first complete copy of the *Iliad*; and Polycrates founded a very extensive one at Samos. The Persians, though not distinguished in literature, possessed a magnificent library at Susa, their ancient capital; and Ptolemy Soter instituted one at Alexandria, which, under the liberal encouragement of his son, numbered 200,000, and finally attained to 700,000 volumes. Rome was indebted for its first public library to Æmilius Paulus and Lucullus; and Augustus formed a splendid collection in the temple of Apollo, enriching it with literary spoils from every part of the empire.

The schools of Rome never acquired any pre-eminence; but those of Spurius Carvilius and Mullotes obtained considerable repute. Egypt and Greece, however, retained to the last their academic renown; and education was hardly considered complete, till, at least, a short period had been passed at Alexandria or Athens.

[7] Mensel's 'Leitfaden zur Geschicte der Galchrsamkeit.'

The literature of antiquity was greatly enriched by the drama, which engaged the pens of many illustrious men; and being exhibited, with scenic effects, before large assemblies of every class, exercised an immense influence over the human race. The stage, indeed, conjointly with the public recitations of poetry, supplied the place of education and books; and diffusing information and moral sentiments among the masses, was to the Greeks and Romans what the printing-press is to ourselves. With them the drama was an institution: in modern times it has become a show, employed not to elevate, not to instruct, but simply to amuse; and the great masters of tragedy, the analysers of human history and human passion, are only heard of in burlesque, or are dimly presented in a pageant.

The drama was founded on a festal ceremony, established in honour of Bacchus. It was customary for the votaries of the god to dance round his image, to the music of the pipe and lyre; and gradually a practice grew up of assuming some disguise or fantastic dress, and staining the face with lees of wine. This was the origin of the masquerade. Thespis, a rustic poet, introduced a chorus,

and travelled from town to town in a cart, from which he exhibited his performances. The verses, being in honour of Bacchus, still retained a religious character, but appear to have had no elevating tendency, as the exhibition was discountenanced by Solon. But, however this may be, it was not suppressed, and Thespis obtained a powerful friend in Æschylus, an Athenian general, who saw the great capabilities of the new art, and gave it a new direction. Under his auspices, Thespis constructed a stage, which was furnished with a standing scene and curtain; he then organised a troop of performers, who, with the aid of dialogue and action, represented a series of incidents, forming a complete story. The chorus, originally consisting of two, was increased to fifty persons, and formed the musical part of the entertainment, but was quite subsidiary to the action. To conciliate public feeling, and allay prejudice, the audience assembled under the presidency of the magistrates, who, before taking their seats, performed a lustration to Bacchus, preserving the primary type of the exhibition. The dramas were in keeping with this solemn prelude, riveting the attention by incidents of a prodigious rather than a romantic cast, and

relating to persons whose moral stature had no counterpart in nature. They laid bare the depths and agonies of human passion, depicted the awful wrath of the gods, and showed the immutability of fate. The allusions to the gods, arising out of the situations of affliction and grief, were always in a reverent, though sometimes despairing spirit; but the effect was to create a religious impression, without any religious confidence. The heart was exposed to view in its frenzy or desolation, throbbing with wild impulses, or convulsed by suffering. In every case, the lineaments were portrayed with masterly fidelity; but the submission to destiny was constrained, involuntary, and, consequently, instilled a feeling of discontent, totally incompatible with trust and faith.

Tragedy was soon attended by comedy, which ran to the opposite extreme; and in a place dedicated to religion, and still consecrated by a religious ceremony, the gods were treated with ridicule, and their reputed actions made the subject of derision. Every moral quality was pierced by the shafts of wit, and laughter provoked by indecency and scurrility. The plays of Aristophanes, the oracle of the comic Muse, are especially

open to these objections. In the comedy of *Nubes*, he has indulged in a coarse attack on the character of Socrates, whose philosophy and precepts, the admiration of every age, are grossly misrepresented, in order to place them in a ludicrous light, while a profane wit mocks at his purity and virtue. From this time personality became a favourite weapon with the comic dramatists, till it was effectually checked by Alcibiades, who rendered it illegal, and under his administration no living character was allowed to be represented on the stage. The comedies of Aristophanes, though so debased by filth and scurrility, captivate by their poignant and ever-brilliant wit; and they were so admired by St. Chrysostom, that he always kept them under his pillow.

Menander, a pupil of Theophrastus, eschewed both the indelicacy and the personality of his contemporaries, and, for the elegance of his compositions, obtained the designation of Prince of the New Comedy, while that of Prince of the Old Comedy was given to Aristophanes. He lived about 293 B.C., a century and a half later than Aristophanes; and was cotemporary with Philemon, who, though greatly his inferior, was, through the

intrigues of his friends, awarded the prize in a contest between them, which so distressed Menander that he committed suicide. Philemon is said to have died of laughter, on seeing an ass eat figs.[8] The other eminent comic dramatists were Eupolis, Crates, and Cratinus.

In the tragic school, Æschylus, its father and founder, was soon called upon to compete with one of his pupils, the immortal Sophocles, who, like himself, was a soldier, as well as a poet. In their first contest, Sophocles bore off the prize, but his supremacy was not left undisputed, and Euripides, another competitor, frequently endangered his fame. In his old age, Sophocles was accused by his children of insanity, and, being cited before the Areopagus, read to his judges the tragedy of *Œdipus at Colonos*, which he had just finished, and then asked if the author of such a production could be mad—a defence so irresistible, that his acquittal, by the unanimous verdict of the judges, was immediately pronounced. Sophocles excelled in the delineation of the heroic character, as it was understood in classic times; and he has been universally praised for the sublimity and

[8] Quin. 10.

majesty of his verse. Euripides, on the other hand, is the poet of love, ever dropping accents of tenderness and pathos, though, strange to say, he was singularly severe on the softer sex, insomuch that he obtained the title of Misogunes, or *woman-hater*. Becoming unpopular, he was obliged to retire from Athens, and sought refuge at the court of Archelaus, King of Macedonia, where, a short time afterwards, B.C. 408, he met with a terrible death, being encountered in a solitary walk by the King's hounds, which tore him to pieces.

Æschylus bears the palm from all competitors as the originator of the drama; and, by the addition of scenery and suitable dresses, he furnished theatric representation with its most powerful accessories. These, however, he considered to be inferior inventions to the mask, which was also introduced by him; and was accompanied by the buskin, designed, by increasing the stature of the actor, to correct the disadvantage arising from the magnitude of the theatre, which placed the spectators at a distance. The professors of the histrionic art, as it was ultimately called, were held in high respect in Greece, where, indeed, talent of every kind flourished, obtaining the homage of public esteem. It was otherwise

among the Romans, who, not being a creative people, had no sympathy with genius; and hence, though assiduously cultivated, art never attained at Rome any special development. We have seen the same character fall to their literature, and it was equally applicable to their drama, which was, in fact, but a continuation of that of Greece. Yet some of the dramatic writers of Rome were admirable poets; and her stage, in the first bright period of its existence, B.C. 40, gave birth to the greatest actor that ever appeared. Roscius was a native of Lanuvium, and carried his art to such perfection, that it has been customary, even to the present day, to call every successful actor after his name. His personal appearance was unprepossessing; his face was deformed, and was further distorted by a hideous squint; yet, when borne away by his part, his power of look and gesture was such, that the audience would not permit him to wear a mask, and he always presented himself uncovered. Cicero was one of his pupils, and derived from him his matchless gift of eloquence, which, at a later period, he was destined to exercise in his defence—Roscius having been exposed to a false accusation, and brought to trial, but, through the pleading of

his pupil, triumphantly acquitted. Cicero's oration in his defence is still extant, and is a masterpiece of feeling and eloquence.

Among the tragic dramatists of Rome, a high place must be awarded to Seneca; while Plautus and Terence share the bays of comedy. Plautus was a contemporary of Varro, who wrote an epitaph for his tomb, and, with sarcastic humour, declared that if the Muse could ever be induced to speak Latin, she would use the language of Plautus. As the Roman tongue, however, acquired more purity, many of the expressions of Plautus became obsolete, and though his comedies still charm by their variety of incident, their breadth of character, and their fidelity to nature, they rival those of Greece in vulgarity and coarseness. Terence preserved the same adhesion to nature, without pandering to a low taste; and his comedies stand alone for elevation of sentiment and exquisite purity of diction. Originally a slave, he received his liberty as a reward for his productions, and, despite his humble antecedents, was honoured with the friendship of the elder Scipio. Of his numerous works, few are now extant, but these will always be prized by the admirers of classic elegance and purity.

The drama shared the decline of literature and the other fine arts, and, indeed, preceded it, though long sustaining a feeble existence at Constantinople and in the principal cities of the provinces. Everywhere the brutalizing sports of the arena and the circus contended with it for the popular favour, and with too great success: the spread of luxury and the universal licentiousness, corrupting every class of society, left it no vocation; and a vitiated taste and wide moral debasement indicated the approach of that night which was soon to cast its shadows over the human mind.

VII.

MORAL PHILOSOPHY AND RELIGION.

OUR history opened with a brief notice of the various religious systems prevailing among the parent nations, whence it was manifest that the human mind was originally impressed with a pure faith, which could only have been communicated by its Maker. This revealed belief had early become obscured, but its leading tenet, the existence of a Supreme Being—the image of God, so to speak—still loomed up through the myths and shadows in which it was enveloped. At what era such corruptions were introduced it is impossible to say; but it must have been within a short period of the Flood, since, as shown at p. 30, ante, Abraham appears to have been brought up in idolatry, as a worshipper of fire. At the same time, we are led to conclude that the one true God was acknowledged among the Philistines at a later epoch, as Abimelech, King of Gerar, when threatened for the abduction of Sarah,

pleaded for his people 'as a righteous nation.'[1] Idolatry is first specifically mentioned in connection with Laban, the father-in-law of Jacob, whose gods were clandestinely carried off by Rachel,[2] whether, as some think, from a secret leaning to idolatry, or from a desire to remove such objects from her parent's sight, does not appear. Moses plainly intimates that idolatry prevailed in Egypt; and though 'signs and wonders' may have presented other ideas to Pharaoh, he did not renounce this traditional practice. We may even believe that the Egyptians had by this time forsaken Osiris for Apis, a conjecture which would explain the golden calf of Aaron, otherwise unintelligible. But, supposing that Apis was now worshipped in Egypt, nothing is more natural than that Aaron, when yielding to the popular clamour, should make an image such as the Hebrews had been accustomed to see, and perhaps to adore, in the Egyptian temples. The Apis of Memphis, the principal deity, was sacred to Osiris; that of Heliopolis to Isis. Osiris was supposed to animate the Memphian animal; and his presence was indicated by special marks, which, on the death of each Apis, guided the priests in

[1] Gen. xx. 4. [2] Gen. xxxi. 19.

the selection of a successor. The colour of the Apis was black, except on the forehead, where it displayed a square white spot, and on the right side, which was marked by a crescent; the figure of an eagle appeared on its back; its tongue rested on a knot, shaped like a beetle, and its tail was composed of double hairs. These specialities were, of course, imparted by the priests, so that, rare as such animals were deemed, an Apis was never wanting for the sacred stall. When the successive oxen had lived a specified time, they were led with great ceremony to the Nile, and there drowned, when their bodies were recovered from the river, and, after embalmment, solemnly interred at Memphis. The death of Apis, whether by violence, or, as sometimes happened, from natural causes, spread lamentation and grief throughout the land; and every one assumed the emblems of mourning. But all were consoled by the discovery of another animal with the distinctive characteristics, and the new Apis was conducted in triumph from the city of Nile to Memphis, and there, amidst the acclamations of the multitude, installed in the vacant temple.

Apis was awarded an annual festival, which

lasted seven days, and each morning he was led in procession through the city, and received the adoration of the populace. Every one contended for the honour of receiving him into their houses, and his breath, accidentally inhaled, was supposed to communicate a knowledge of futurity.[3]

Isis was the sister of Apis, and was usually worshipped under the form of a cow. From Isis and Osiris, with their parents Saturn and Rhæa, sprang the whole heathen mythology; for originally the various gods and goddesses were, in fact, but different names for one or another of these deities, though, in course of time, they came to be regarded as distinct beings. Thus Isis was the moon, and Osiris the sun; Isis was Juno, and Osiris Jupiter: and, not to swell the catalogue, Isis was the Cybele of the Phrygians, the Minerva of Athens, the Venus of Cyprus, the Proserpine of Sicily, the Ceres of Eleusis, the Diana of Crete, and the Bellona of the Romans. Such is the ladder of religious doctrines: such the gradations from the original, revealed faith of a Supreme God and a divine Redeemer to the grovelling superstitions of polytheism; and by such steps did the human

[3] Herod. ii.; Plin. viii.; Stra. vii.

mind descend, till, in the words of the sacred historian, it turned its glory into the similitude of a calf that eateth hay.

It was the custom of all the primitive nations to seek counsel of Heaven in times of difficulty. The Jews, under the Levitical administration, consulted their prophets, and, through them, received an answer direct from the Deity. Under the idolatrous hierarchy, resort was had to the prophets of Baal. Heathen communities pursuing the same practice were guided by oracles, the most famous of which was that of Delphos, at the foot of Mount Parnassus, and the oracles of Dodona and Memphis in Egypt. The counsel of Apis was invoked by an offering of incense, when the inquirer, in presence of the priest, whispered in the animal's ear, and his answer was deduced from the first sounds he uttered. The oracle of Delphi was in charge of a priestess, called Pythia, and was delivered from a three-legged stool or tripod, perforated in the centre, and placed immediately over a natural vent in the earth, emitting sulphurous vapour, said to be infused with the breath of Apollo. Pythia, before exercising her functions, dipped her head in the Castalian fountain and wreathed her brow with laurel: then,

seating herself on the tripod, she received her inspiration, sometimes with perfect composure, at others with such fearful yells and outcries, that her attendants fled horrified from the temple. The oracles were originally delivered in hexameter verse, but on its being sarcastically remarked that the god of poetry, to whom the temple was dedicated, was a bad poet, they were pronounced in prose, and, in this shape, some of them still remain among the puzzles of history.

The Romans, though much influenced by the Egyptians and Greeks, did not establish an oracle, but they virtually adopted its usages, as, in periods of danger, they had recourse to the Sibylline verses, and auguries were drawn from their sacrifices by the soothsayers.

We have seen (p. 32, ante) that the Brahma of the Hindoos primarily represented the one presiding Deity. 'Brahma, the Spirit of God,' observes an eminent Pundit, 'is the mighty Lord, who is present in every space.'[4] How could we recognise this Omnipotent Being in the hideous Juggernaut, whose chariot-wheels are drawn over the necks of his worshippers? The Egyptians adored the Nile; in India, superstition deified the

[4] Dissertation in Halhed's 'Gentoo Laws.'

Ganges. At Allahabad, near the confluence of that river with the Jumna, it was an annual custom for numbers to throw themselves into the stream—voluntary sacrifices to Brahma. The celebrated temple of Somnath, dedicated to Siva, by his title of Swayam Nath, or Self-Existent, was the scene of the most horrible atrocities, perpetrated in the name of religion. In this senseless idol we probably meet the Moloch of the Scriptures, to whom the mothers of the East offered their first-born children, fathers their daughters, and less brutal votaries their own lives. Human sacrifices were more or less common among all barbarous nations. The Druids burnt whole hecatombs of victims, enclosed in the idols themselves, which, made of wicker, afforded at once a convenient receptacle, and the means of sustaining the flames. The inhabitants of Mexico and Peru offered up human victims at their festivals, in honour of the sun and moon, the god of war, and the god of the air.[5] Yet, under the veil of a gloomy mythology, both Aztecs and Incas typified one overruling Lord, and preserved obscure traditions of incidents recorded in Genesis.[6] What is stranger still, their re-

[5] Prescott's 'Conquest of Mexico.'

[6] Ibid.

ligious rites included a baptismal ceremony, in which they sprinkled water on the lips and breasts of infants, at the same time imploring 'the Lord to suffer the drops to efface the sin entailed on the child before the foundation of the world, so that it might be born again.'[7]

As if to attest the fact that the Almighty has never left himself without witness on the earth, there is evidence of a pure faith in individuals, even in the benighted times when, with the exception of the chosen people, the whole world was immersed in idolatry. In the primitive ages we hear of Melchisedec, King of Salem, and Job and his friends; afterwards of Jethro and Balaam; and, coming to a later epoch, of the Wise Men of the East, who were thought worthy to be conducted to the manger of Bethlehem. Sibyls, of whom mention is made by Josephus,[8] are believed to have been depositaries of the true religion, in the darkest periods of heathenism; and perhaps we are presented with an example of these holy women in Deborah under the old, and in Anna, the prophetess, under the new dispensation.

Menu is the first religious teacher we

[7] Prescott's 'Conquest of Mexico.' [8] 'Antiq. of the Jews.'

encounter in the pagan countries of the East. The precise date of his birth cannot be ascertained; but his celebrated *Ordonnances*, the corner-stone of Brahminism, are proved to have been written prior to B.C. 880, some twenty years before Lycurgus gave his laws to Sparta. They have been translated into English by the great Eastern scholar, Sir W. Jones; and comprise a code which, by its union of exalted sentiments and trivial injunctions, its alternate lenity and severity, unites the two extremes of sublime and ridiculous. Ostensibly the ruling power is divided between the government and the priests, each, in appearance, designed as a check on the other, but really operating for mutual support, though the authority greatly preponderates in the priests. The metaphysical and philosophical speculations are, for the most part, puerile, but, here and there, reveal a lurid light, and inculcate a dependence on the Supreme Being, and a spirit of tender benevolence to mankind.[9]

The system of Menu produced the fruits which might have been expected from such seed. All the authority of the altar, the keys

[9] 'Institutes of Hindoo Law, or, The Ordonnances of Menu,' by Sir W. Jones.

of futurity, every avenue to Heaven, had been seized by the priests; and so insidiously had they wormed themselves through the whole framework of society, that believers could perform no religious, no public, and scarcely any domestic act, without their interposition.[10] Menu had taught that 'the Being whose powers are incomprehensible, having created this universe, again became absorbed in the Supreme Spirit,[11] delegating the government of the world to a number of inferior deities; but, by the superstitious practices of the Brahmins, the image of the overruling God was effaced, and the subordinate divinities multiplied to infinity. It was under these circumstances that the Brahmin schools brought forth the teacher who, about B.C. 550, assumed the name of Buddha, or the Enlightened. His original doctrines, hardly traceable among his present disciples, have lately been made the subject of a searching disquisition,[12] which has penetrated the obscurity of the past; and brought them into the light of day. There can now be little doubt that Buddha was an Atheist. He taught that nature was an illusion, the world imaginary, and life a

[10] Ward's 'Ancient India.' [11] 'Ordonnances of Menu.'
[12] *Times*, April 17, *et seq.*

dream, which, passing through various transformations—the transmigration of the vital principle from one state of being to another—terminated in annihilation. This final end was represented as the pinnacle of mortal aspirations, and would be the sooner attained by those who, during their probation, led a virtuous and blameless life, while a prolonged existence would be entailed by cruel and wicked actions. A creed so unsubstantial had nothing to link it with the inherent longings of the soul; and the disciples of Buddha, improving on the conceptions of their master, changed his reward of annihilation into a paradise, and the prophet himself into an incarnate God. Reappearing in a succession of bodies, he permanently resides on earth, the spiritual ruler of the faithful, while lamaseries of monks propagate his doctrines, and celebrate his worship.[18] The present residence of the Tale-Lama, as he is called, is Lha-Ssa, the capital of Thibet; and here his authority has been established almost from the era when Buddha really lived.

The study of nature and the development of reason ultimately presented a crude idea of one Supreme Deity to the speculative minds

[18] Huc's Travels.

of the sages of Greece; but polytheism had taken such root in the pagan world, and was fenced round by so many superstitions, that it could only be eradicated by a direct interposition of divine power. Even in the full light of inquiry and revelation, how difficult is it for the intellect, when darkened by the influence of early ideas, to discern its way from error to truth! and this difficulty was incalculable under a religion which prohibited inquiry, which took possession of every faculty, and, adapting itself to the genius of different nations, was in one land fanatical, in another dreamy, in a third sensual, and united all these qualities in a fourth.

The renowned mysteries of Eleusis, established in Attica by Eumolpus, B.C. 1350, imposed on the initiated an oath of secrecy, the infraction of which was punished by death, and the same penalty was incurred by joining in the rites without previous initiation. Ceres was the patroness of the Eleusinia, while the frantic orgies of the bacchanals were dedicated to Bacchus; and, viewed together, the two institutions furnish a striking illustration of the Protean character of paganism, in addressing itself, by turns, to every taste. Designed for so refined a people as the Greeks,

the Eleusinian arcana appealed to the moral qualities, and could only be acquired by persons of unblemished repute. They held out to all who embraced the vows the special protection of the gods, with happiness in the present world, and the Elysian fields in the future. Such advantages, insured by the seal of religion, attracted immense numbers to the society, which was approached, in the first instance, by a sort of novitiate, called the *lesser mysteries*, extending over a period of nine days, passed in abstinence, purification, and self-denial. The novice then sacrificed a goat to Jupiter; and tying the skin of the victim under his feet, and wreathing his head with flowers, joined the priests in prayer, when the ceremony was complete. After an interval of a year, the *mustai*, as the new brethren were designated, obtained admission into the *greater mysteries*. The initiation commenced with the sacrifice of a sow to Ceres, when the *mustai* were crowned with myrtle, and conducted, under cover of night, to a vast edifice, called the mystical temple. Here all the juggleries of the priests were brought into operation to impress and awe their minds. From a gloomy passage they came suddenly into a hall radiant with

light, but which the next moment was enveloped in darkness; the floor quaked; lightnings flashed from the unseen altar; and peals of thunder, accompanied by still more discordant sounds, rolled through the building. At length, light reappeared; the *mustai* washed their hands in holy water; and were led up to the Hierophantes, or high priest. By this dignitary they were admonished that it was of no avail to purify the body, unless they maintained a moral innocence in the soul; and they were told that such an object could only be attained by conforming to the mysteries, which were then read from a holy book, composed of two stones; and termed *petromæ*. With the high priest's exhortation, the solemnity concluded.

Livy has left us a vivid account of the Bacchanalia,[14] from the testimony of the freedwoman Hispala; and it reveals, in its horrible excesses, such a depth of wickedness, as could not be described in these pages. It is enough to know that it was a maxim of the fraternity that nothing was unlawful, and, consequently, there was no crime which they did not practise. Women and men were equally

[14] Livi xxxix. 14.

bad; and, in the dead of night, the city was often horrified by the cries of the female votaries, as, emerging from their haunts, they rushed in frantic bands to the banks of the Tiber, dipped their torches in its waters, and then returned to renew their orgies in vaults and caverns. Their proceedings were at length denounced by Hispala, and, on her accusation, numbers were thrown into prison, tried, and executed; but ages elapsed before the Bacchantes were finally extirpated.

Though the Greeks contributed more by their mythology than any other people to materialize religion, they, at the same time, spiritualized it by their art, and, still more, by their philosophy. Philosophy in a crude form necessarily existed from the creation of man, inasmuch as it comprehends those objects which most attract and interest the reason; but it was in Greece that it found its first seminary. Here it took root—a root stunted, but not unfruitful, since it implanted a new intelligence in the human mind.

Philosophy embraces three great subjects—the knowledge of God, which is called Theology; the origin and phenomena of nature, classed under Physics and Metaphysics; and

the relations of man, which are referred to Logic and Ethics. As we have just reviewed the prevailing theologies, and, in a previous chapter, traced the successive advances of cosmogony, we shall now state no more on these subjects than is necessary to illustrate the third branch of philosophic knowledge, in its direction of human thought.

The cosmogony of the Chaldeans, which is the oldest of the ancient systems, derived all things from two elements, darkness and water, and contended that it was from these materials the Supreme Being formed the world.[15] Sanchoniathon attributes a similar doctrine to the Phœnicians, who, according to this authority, believed the earth to have been derived from chaos, by the operation of some irresistible power.[16] The Egyptians, who were the ancestors of the Phœnicians, held the same view, but they associated it with another doctrine, which is the base of the modern science of geology; and contended that nature is in continual transition, by the alternate process of decay and reparation. Herodotus ascribes to the Egyptians the origin of the doctrine of the immortality of the soul.

[15] Enfield's 'Hist. of Philosophy.'

[16] Eusebius, 'Preparatio Evangelii.'

'They say,' he observes, 'that the soul of man is immortal, and that when life expires, it enters into another animal, thus springing constantly into existence; and when it has passed through the different terrestrial, marine, and aerial beings, which occupies a period of three thousand years, it again enters into a human body. Some of the Greeks have adopted this opinion; some earlier, some later, as if it were their own; but though I know their names, I do not mention them.'[17]

As we find the immortality of the soul taught at Athens in the Eleusinian mysteries as early as 1350 B.C., within a century of the departure of the Israelites from Egypt, and Herodotus here tells us that it was held by the Egyptians prior to its introduction into Greece, there can be no doubt that it was also familiar to the chosen people, although, having in view only temporal institutions, the laws of Moses do not expressly affirm it. The great legislator, indeed, in his capacity of historian, has set forth the fact in recording the translation of Enoch, who, we are told, '*was not*, for God took him;'[18] and we are thus made aware that the

[17] Herod. ii. 122. [18] Gen. v. 24.

doctrine was current prior to the Flood. Again, he announced the final resurrection through the mouth of Balaam—'I shall see him, but not now;'[19] and, five centuries later, Solomon declares, 'Then shall the dust return to the earth as it was, and the spirit shall return unto God who gave it.'[20] The doctrine of transmigration of souls may have been acquired by Pythagoras in India, as well as in Egypt, since it existed among the Brahmins and Buddhists from a very remote period. The Brahmins, as shown in our account of Menu, believe the soul to be an emanation from the Spirit of God, which passes from the human body through a variety of animals, and, according to the tenor of its career on earth, is destined either to endless torment, or to absorption in the beatitude of the divine bosom. The latter incomprehensible destiny is especially promised to those who have never uttered a falsehood, and, in terms no less emphatic, to widows who have destroyed themselves on the funeral piles of their husbands.

The Brahmins and Buddhists shared the conscience of the East with the Sabeans and Magians. The Sabeans, seated chiefly in

[19] Num. xxiv. 17. [20] Eccles. xii. 7.

Arabia, professed to have been originally founded by Sabi, the son of Seth; but their designation was more probably derived from the Hebrew word Sabi, or *the stars.* Originally the creed embraced the doctrines of the unity of God, the immortality of the soul, and future rewards and punishments, while the Deity, as the Supreme Ruler of all things, was held in such veneration, that prayers could only be addressed to him through the intervention of angels, severally throned in the planets. In course of time, the adoration was transferred from the invisible spirits to the visible objects—to the heavenly bodies themselves; their images were set up in groves and temples, and, receiving the worship of the multitude, the faith in a presiding spiritual Deity disappeared. Hence arose the grossest idolatry, accompanied by rites of a revolting character, including the sacrifice of infants, who, with the consent of their parents, were buried alive in honour of the idols, or offered up on their altars.

The Magians had their origin in Persia. Their creed inculcated the universal article that there was one Supreme, Omnipotent Deity, the Creator of all things; and that he had called the world into existence from two

elements, Ormusd, or light, and Ahriman, or darkness. These two principles were also spirits, with the respective attributes of good and evil, and maintained a perpetual conflict, in which, if either preponderated, Mithras, the sun, acted as a mediator. God was to be worshipped as the first cause; the demon was propitiated by sacrifice; and the great luminary of day, whose influence was ever felt, received a grateful tribute of thanks and praise.

The Magian creed was reformed, if not actually founded, by Zoroaster, who, by the aid of magic, imposed himself on the Persians as a messenger from Heaven. He is by some confounded with Moses; but is represented by Plutarch to have lived about five centuries before the siege of Troy, which would make him a contemporary of Joseph. There appears, however, to be no authentic evidence of his having existed prior to 580 B.C.; and facts have been adduced to prove that he was no other than Gehazi, the servant of Elijah, who, on his dismissal by that prophet, retired into Persia, and there promulgated a system based on the corruptions of Judaism. With these he retained the ancient worship of fire, as a

type of Mithras; the sun, though it had been denounced by Solomon, in the Book of Wisdom—'Surely vain are all men by nature who are ignorant of God, and could not, by considering the work, acknowledge the work-master; but deemed either fire or wind or the swift air, or the circle of the stars, or the violent water, or the lights of heaven, to be gods which govern the world.'

Arabian pilgrims all resorted to the temple of the Caaba, at Mecca, which has since been invested with a higher renown as the cradle and tomb of Mahomet. The wall of this edifice enclosed a divine stone, originally a jasper of dazzling whiteness, but rendered black by the sinful lips of pilgrims, who, as the local chroniclers declare, relieved themselves of their guilt by covering it with kisses. So precious a relic could only have fallen from heaven, whence it was accordingly derived; though some of the Arab sages, not satisfied with this tradition, considered it to be a petrifaction of the guardian angel of man, thus metamorphosed, on the ejection of Adam from Paradise, as a punishment for his lack of vigilance. But, whatever difference of opinion might exist respecting its origin, all agreed in holding it

in veneration, and it attracted pilgrims from every part of the East.

China participated in the idolatrous creeds which enchained the fairest regions of the East; and from its earliest mention in history, is associated with the foulest superstitions. A pure theism, however, was promulgated by Confucius, about the same time that Zoroaster arose in Persia, B.C. 580, and he possibly drew his doctrines from the same source —the corrupted form of Judaism. They taught that there was but one God, who was eternal and omniscient, and that the sky, spread over the universe, was the visible emblem of his presence: as such, it was to be worshipped with prayer and praise, on the tops of mountains, but the special favour of the Divine Being could be gained only by a blameless life. Similar principles were inculcated by the great reformer Lautse, B.C. 550, and by Kong-fu-tu, who flourished a century later; but the Chinese so disguised the new creed with superstitious observances, including the deification of the elements, and a cumbrous machinery of genii and angels, that its original features were obliterated, and it has long sunk into a gross idolatry.

In the East the knowledge of a Supreme

Being was either imparted by tradition, or acquired from the Jews: in Greece it was deduced from philosophic speculation. Socrates, the most eminent of the Grecian sages, was the first to arrive at the divine truth. This great philosopher was born at Athens, B.C. 330; and was the son of Sophroniscus, the statuary, by his wife Phenarete, a midwife. Born in a corrupt age and a voluptuous city, and trained in the stern school of the camp, amidst the horrors and licence of war, Socrates was distinguished for the rare virtues of his character, and the probity of his life, so that, in his more advanced years, he was said to have drawn down philosophy from heaven to earth, as much by his actions as his wisdom. While a soldier, he was conspicuous for his bravery in the field, and, on one occasion, by his gallant interposition, he saved the lives of two of his pupils, Alcibiades and Xenophon, just as they were overpowered by the enemy. He assisted his father in the manual part of his vocation, and himself moulded the celebrated group of the Graces, one of the most exquisite productions of Grecian art. Labour he deemed a pleasure, and his frugal habits and simple wants rendered him indifferent to poverty, which,

indeed, he preferred to wealth. By rigorous discipline, he acquired such perfect serenity of mind, that nothing could disturb it; and his countenance preserved a calm and placid expression uuder every circumstance of provocation or danger. Having no views of personal profit, and seeking only to benefit mankind, he promulgated his doctrines in no particular spot, but wherever he could assemble an audience,—in the public streets, and on the banks of the river, as often as in the groves of the Academy. The mirror of nature showed him the image of a Supreme Creator, who was not more powerful than beneficent, and he tried to raise the understanding of his countrymen, which saw no comeliness in their beautiful idols, to the perception of this Being—so apparent, though invisible. He taught the obligations of morality, clemency, and self-denial, and instilled his principles, not more by his lips than by his life. Detraction could whisper nothing against a character so perfect, but he became an object of envy, in the same proportion as he excited veneration; and, at length, his enemies, incensed at his popularity, employed the wit of Aristophanes to bring him into ridicule on the stage. Virtue, however,

afforded little room for derision, even to so brilliant a genius, and it was found more easy to invoke prejudice, and accuse the philosopher of immorality and impiety. Such malice only filled him with compassion for the infirmities of human nature; he defended himself with simplicity and modesty, but with uncompromising boldness; and showed that his alleged immorality consisted in the inculcation and practice of virtue, and his impiety in ascribing higher attributes to the Deity. Socrates, as his last moments proved, had no fear of death, yet, perhaps, from deference to the prejudices of his judges, or of mankind, he appears, while recognising one overruling God, not to deny the existence of inferior divinities, though he seems to have regarded them less as deities than as what would now be called Saints, or men whose memory, sanctified by eminent virtues, is held in veneration after death. In his defence to the Areopagus, he declared that he promulgated his doctrines by command of the gods, whose authority he regarded more than that of his judges; and this certainly implies that he did not wholly abjure polytheism. But, as he was conducted back to his prison, he seems to have professed a different creed to his

friends, exclaiming—'I go to die, you to live: which is the best THE DIVINITY only can know.' His end was in keeping with this noble sentiment, and with the tenor of his life. The celebration of the Delian festivals, which lasted thirty days, delayed his execution, and he passed the interval in the society of his friends, and of Xanthippe, his wife, endeavouring to soothe their grief by discourses on the immortality of the soul, and the vanity of human pursuits. By bribing his gaoler, Crito secured him the means of escape, and urged him to fly; but he firmly resisted his entreaties, asking with a smile where he could escape from death. Another friend deplored that he should be condemned to suffer, although he had committed no crime, and he calmly answered —'Would you, then, have me die guilty?'[21] Such was the end of this mighty spirit, whose natural gifts and moral excellence present to us the highest type of the human mind.

The Areopagus, by which Socrates was condemned, might be termed the Athenian Inquisition, since it was intrusted with the guardianship of the established religion. It was before this tribunal that Pericles defended

[21] Phi. de op. Phil. Va. Ma. iii. 4.

Aspasia, when she also was charged with impiety, and he then delivered that celebrated oration, which drew tears, not only from his auditors, but himself. Phryne, another courtesan, was tried on a similar accusation, and, at the last moment, saved her life by unveiling her bosom, her judges being so captivated by its beauty that they could not pronounce her guilty. St. Paul was also arraigned before the Areopagus, for preaching Christianity; and it is his lips that apprise us of the Athenian altar to the Unknown God, the 'Divinity' of Socrates.

Socrates may be considered as the founder of moral, and, perhaps, of psychological philosophy—looking at the one as applied to the feelings, passions, and motives; and at the other as relating to the faculties and mental perceptions. He not only enforced the practice of virtue as a natural obligation, due from man to his Creator; but he also taught that it was essential to happiness, which he held to depend, not on selfish gratification, but on an approving conscience. This was the more singular, as he was constitutionally disposed to indulgence—to such a degree, indeed, that it was portrayed in his countenance, so that a physiognomist remarked that his heart was

the most corrupt in the world. This declaration he uttered at the risk of his life, as he was immediately surrounded by assailants; but Socrates, more forbearing than his disciples, generously protected him, affirming that he had spoken only the truth—that his heart was, in its nature, such as had been described, but was kept in subjection by his judgment. In psychological science, Socrates emancipated the mind from the delusions of previous sages, and admitted no opinions that could not be deduced from experience or observation. He sounded the depths of human reason, declared its capabilities, and shadowed forth its vocation and mission. What would have been the destiny of our species, had his pupil Plato, and, still more, his renowned successor, Aristotle, followed in his track, and adhered to the same principles? But Plato lost himself in the mazes of his imagination. On the other hand, the Stagyrite, beginning with facts, ended with conjecture. After rejecting the errors of the past, and applying himself to the collection and study of principles, he made his physics subservient to a fallacious system of logic; and science was stifled by a syllogism. The theology of Aristotle ap-

pears to have been equally wayward and confused. The grandeur, majesty, and immensity of nature, which he so unveiled and explored, bewildered and confounded him; and he was now led by one opinion, now by another: at times proclaiming himself an atheist, and then uttering the sublime adjuration—'Being of Beings, have mercy upon me!'

The mind of antiquity, then, attained its culminating point in Socrates; for a moment it escaped from night, and caught a glimpse of morning—an emanation of divine intelligence. But the force of habit was stronger than nature. The half-converted faculties relapsed; reason forged itself new chains; and, abjuring freedom, was bound to the rock of its own superstitions.

The new systems of philosophy rose on the ruins of that of Socrates. They were many in number, but, in theory, professed the same objects, the moral elevation and happiness of man. The principal sects were the Platonic or Academic, originated by Plato; the Peripatetic, by Aristotle; the Cynic, founded by Antisthenes, and of which the most noted example was Diogenes; and, lastly, the Stoic, established by Zeno, who, it is said, pilfered his doctrines from Heraclitus.

The Peripatetici are said to have received this name from their practice of constantly walking, while they received the instructions of their founder, Aristotle. Their doctrines blended the ethics of Socrates with the logic of Aristotle; but they contended that, though self-control was both a pleasure and a duty, the passions were, in certain cases, to be allowed a moderate action, as a constituent part of our nature. They considered the moral and intellectual faculties to be the source of happiness, and believed that men were enabled, by the exercise of their reason, to raise themselves over the power of circumstances, and secure their own felicity.

The Peripatetic sect spread into Italy, where, however, it had to compete with that of Epicurus, a potent and insidious rival. Epicurus adopted the atomic theory of Leucippus and his disciple Democritus, of which, as well as the Leucippian doctrine of a *plenum*, we shall have to speak hereafter. Democritus denied the immortality of the soul, declaring that the soul died with the body. It was thought that he could be brought to recant his doctrine, by what might appear a supernatural visitation; and, with this view, some young men assumed a ghostly

garb, and entered his cave in the dead of night, surrounded by every accessory of terror. But the philosopher was perfectly unmoved, and, after they had exhausted their devices, remonstrated with them on the folly of their conduct. Yet he seems not to have intended the absolute annihilation of the soul; for when Darius was inconsolable at the death of his Queen, Democritus, who was then at his court, offered to restore her to life, provided the King would find three persons who had never known adversity, and whose names he could inscribe on her tomb. After a diligent inquiry, Darius was obliged to abandon the search, acknowledging that sorrow was a common heritage, from which no one could escape.

But, in a religious point of view, no system took such root as that of Plato, which based the pure theism of Socrates on the ancient traditions of Egypt. It thus linked truth with current delusions, with mystery, and with primitive faith, elements which, in all ages, have commanded the sympathy, veneration, and spiritual allegiance of mankind, and which were irresistible when, as in this case, they united the present with the past, and shadowed forth the future. Antique

myths enchained the pagans; mysticism and speculation attracted the sceptics; and the prophetic outlines of Egyptian theology allured the Christians. It was by this dim light, almost extinct at Karnac and Luxor, that Plato, unravelling the web, imperfectly discerned the attributes of the Unknown God of Socrates; and under Egyptian tuition, under guidance of immemorial tradition, he faintly indicates the Creative Deity, the universal Father of Life, and the Logos, or Son, ascribing to the Divinity three types in one Being. Only a divine teacher could give this great truth a full enunciation, and this mission was reserved for the Messiah; but some of the early Fathers of the Church, not sharing the general abhorrence of heathen learning, saw in the Platonic doctrines the vestiges of a previous revelation, perhaps coeval with the creation of man.

Though revelling in divinity, the manifold systems of the Greek philosophers, so conflicting in principle, all depended on the same theory of logic, which, being brought to its highest perfection by the Stagyrite, received the name of Aristotelian. The great subject of their speculations was Nature—its origin, character, and destiny; and they assumed

that it comprehended an endless variety of elements, always in a state of transition, and, consequently, beyond the grasp of analysis. Thus science was arrested at its root, as it was denied the light of experience and the free atmosphere of inquiry. Experimental knowledge, the touchstone of truth, was not only never sought, but was rigorously excluded; and, in its place, there rose a theory of syllogistic reasoning, abrogating the true purpose of logic. By this system, every object in nature, animate and inanimate, every moral quality, and every specific idea, whether referring to the past, the present, or the future, were ranged in nine distinct classes, called by the Greeks *categories*, and by the Romans *predicaments*. These were again reduced, in connection with some affinity of character, quality, or relation, to five *predicables*, marking the abstract predicate of the various subjects in special reference to their class. Thus Mathematics were comprehended under Quantity; Geography was ascribed to Where; Chronology to When; and so, according to some arbitrary distinction of character or material, the classification was extended through the whole universe. These fallacies were so many fetters to thought, and esta-

blished a despotism over the mind surpassing anything hitherto experienced, and which was only overthrown when Bacon, after an interval of nearly two thousand years, promulgated a new system of logic, based on induction and reason, emancipating intellect from the delusions of antiquity.

END OF VOL. I.

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